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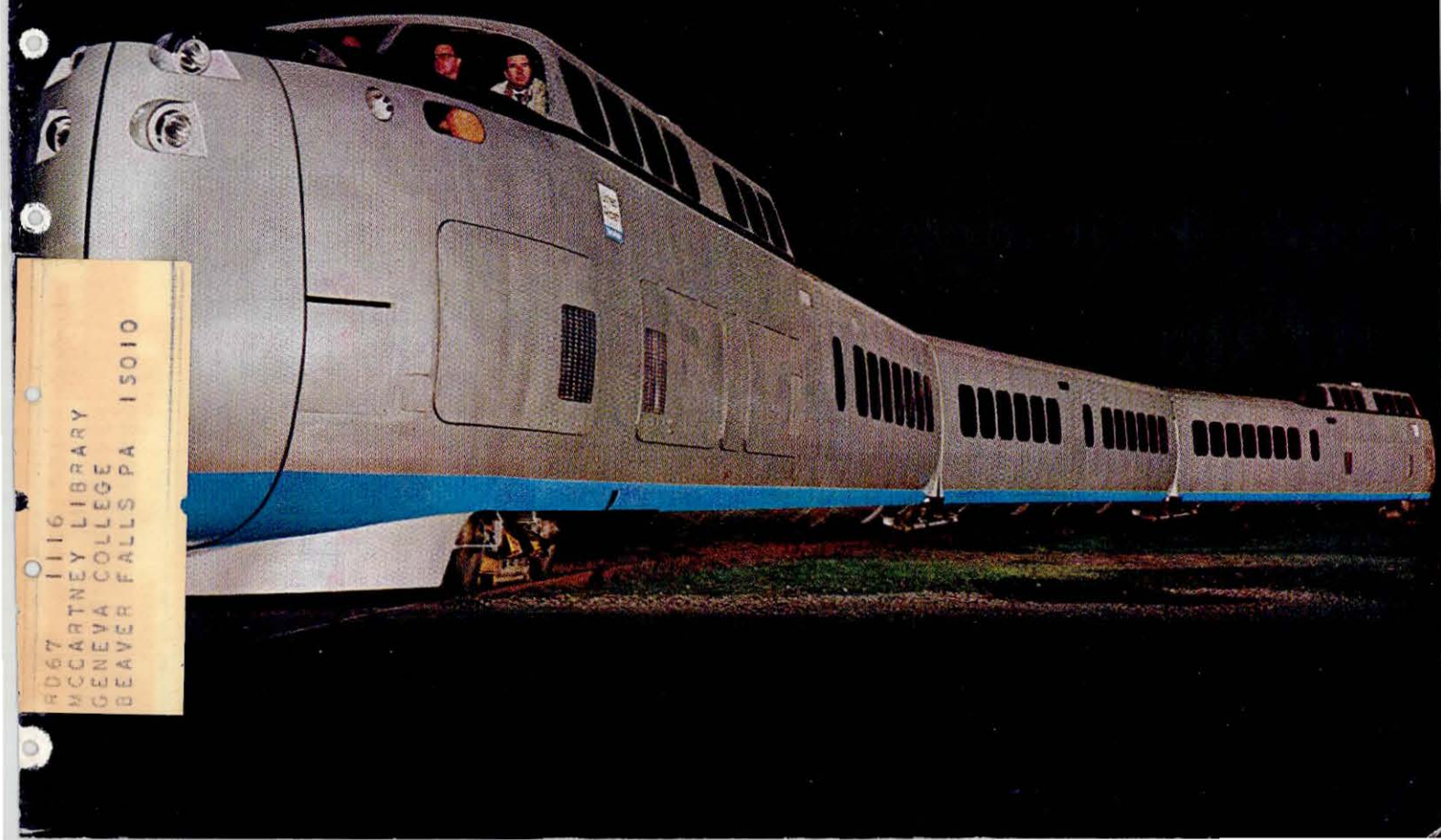

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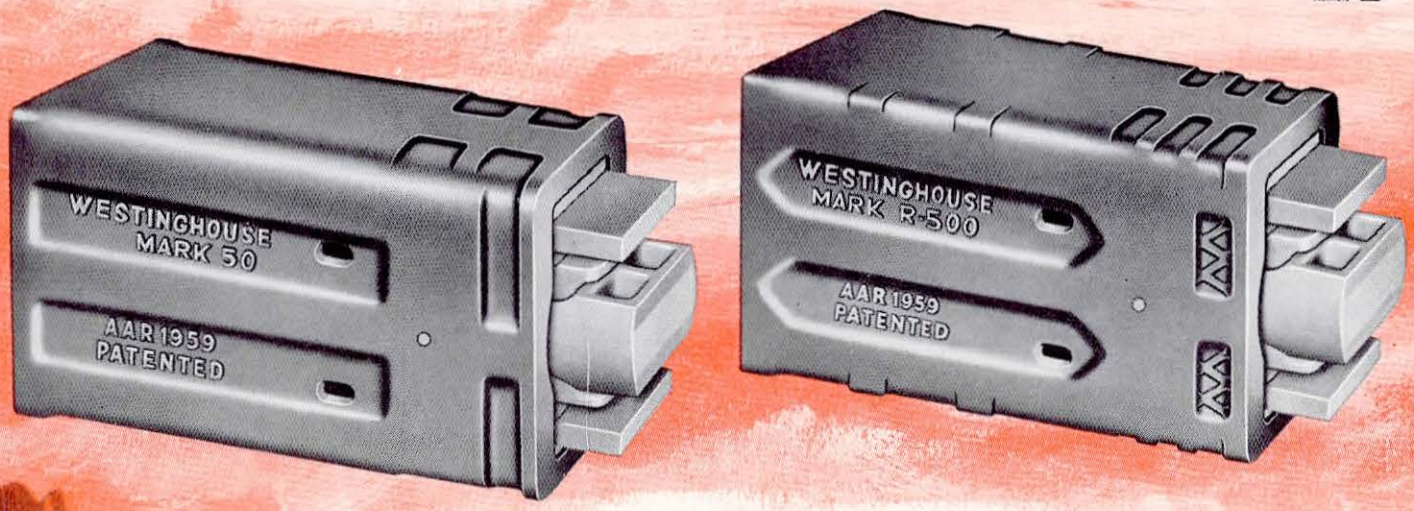

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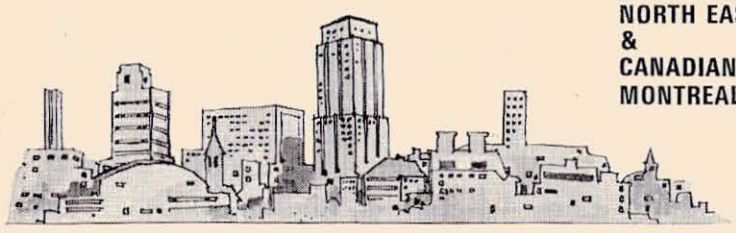

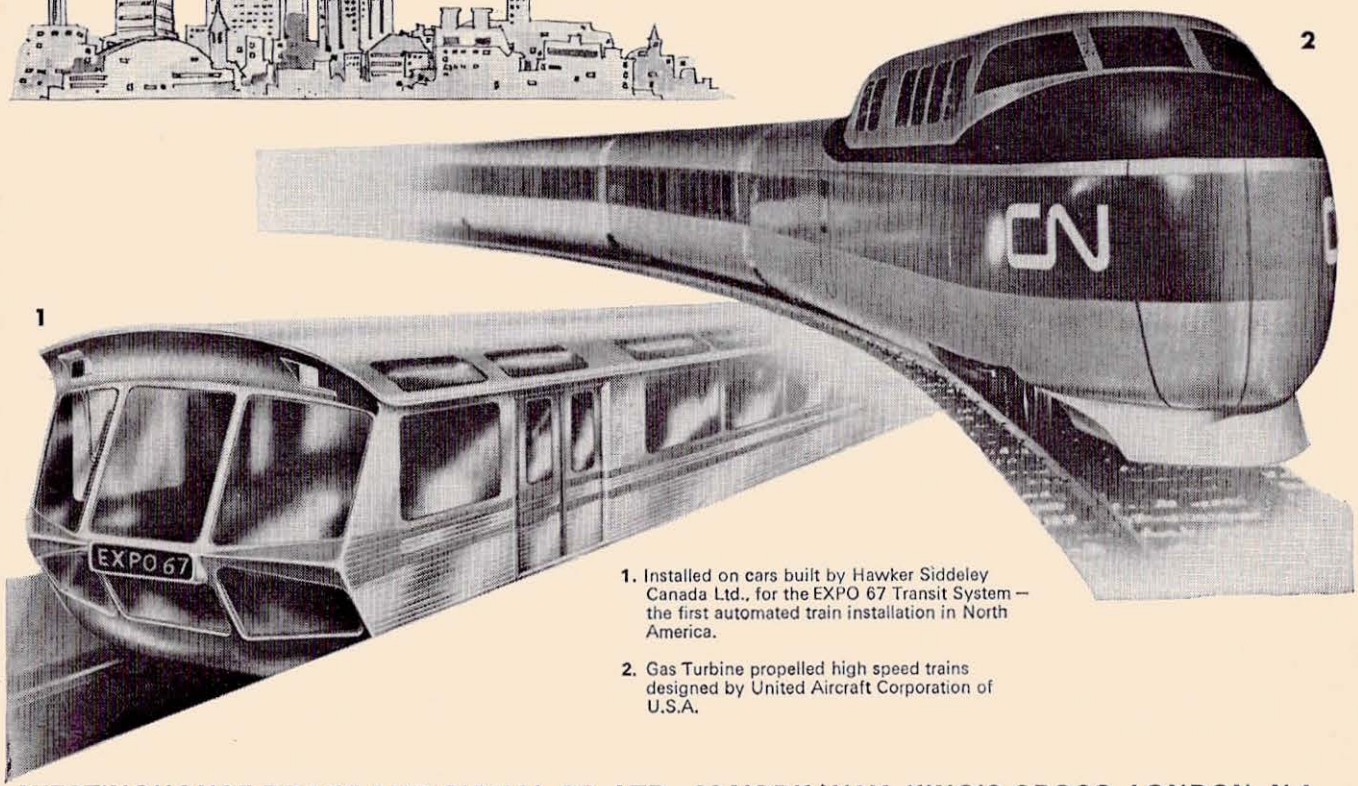


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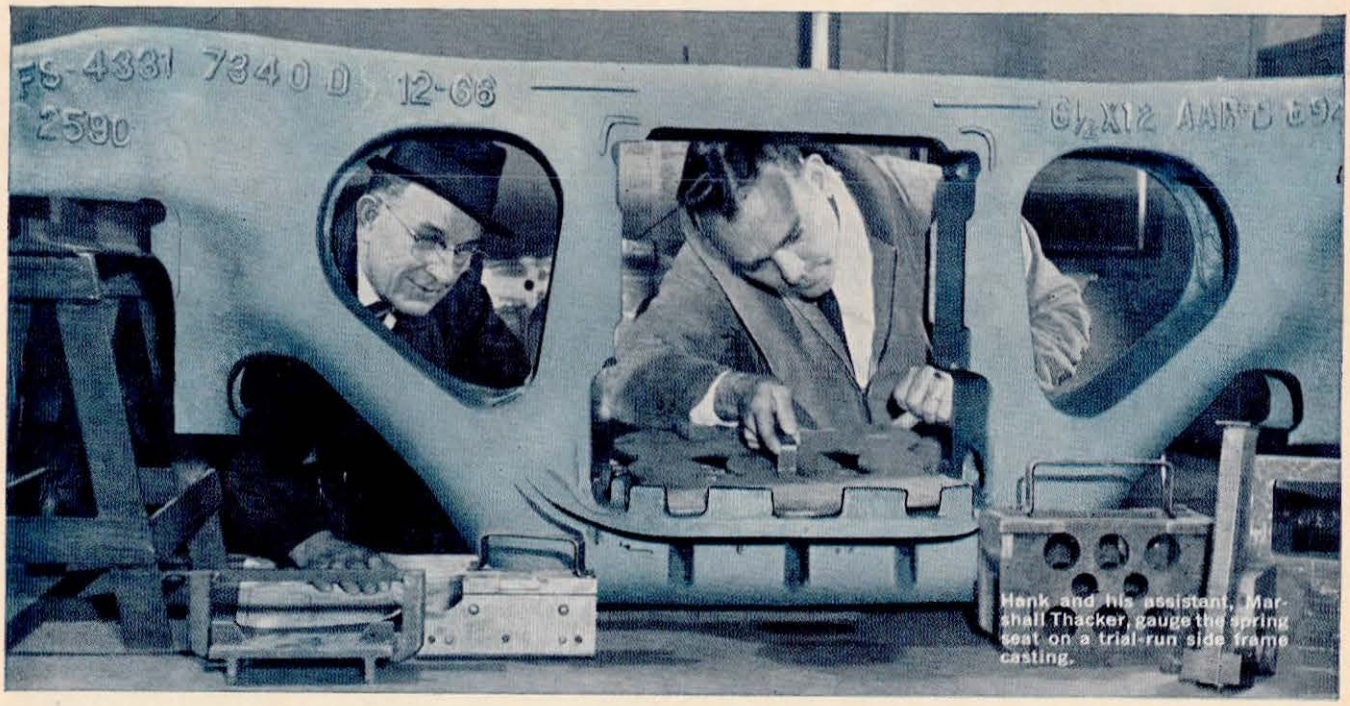


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# SHORT AND SIGNIFICANT

**Pennsy buys Flexi-Vans for mail service**

The Pennsylvania will put 100 Flexi-Vans into mail service around July 1. This will be Pennsy's first venture into this type of containerization pioneered by its prospective merger partner, the New York Central. Strick is now delivering the 40-foot-long, 2,650-cubic-foot-capacity vans; and New York Central is supplying Pennsy with 50 specially-equipped flat cars for the service. The mail vans will move in both passenger and freight train consists. They will be assigned initially to runs to and from Chicago, St. Louis, Columbus, Pittsburgh and Harrisburg, Pa. A spokesman said the railroad will later extend Flexi-Van mail service to other mail terminals in its 13-state network.

●

**BRT: First out, and with some moderation**

New wage demands by any rail union can't be served before September, at the earliest. But the Brotherhood of Railroad Trainmen already knows what those demands will be: A 12½% wage increase, improvement in holiday and vacation provisions and a broadening of health and welfare programs. BRT general chairmen have approved the package, which will be served later in two parts. There may be some significance in the amount of the union's basic wage demand. Last time around, the first notices served were in the stratosphere. Several unions demanded 25%, others called for 18%. Settlements, with those that have settled, approximated 5%. Observers reading the signals figured that initial demands next time around might be somewhat more moderate.

●

**CP plans to expand customer service program**

Canadian Pacific is pleased with the operation of its Customer Service Centers, so it is planning to expand the system. Centers are planned for Regina and at Toronto's Agincourt freight yards. Three other locations for the centers are under study. CP's system integrates a toll-free telephone network, telecommunications circuits, data processing, computers and mobile representatives into a single service group handling all customer relations for railroad, airline and telecommunications. Customers can telephone the centers directly, toll-free, 24 hours a day, seven days a week, to order anything ranging from a freight car to tickets for a Caribbean cruise.

●

**LIRR gets federal funds for line work**

Department of Housing and Urban Development officials last week announced a grant of $22.6 million to New York's Metropolitan Transportation Authority for improvements on the Long Island Rail Road. MTA Chairman Dr. William J. Ronan said the money would be used for upgrading of existing electrification and for extension of electrified lines from Mineola to Hicksville, and from Hicksville to Huntington on the Port Jefferson line. The money will be added to funds already committed by the state as part of a $200-million modernization program for the LIRR.

●

**New electric plant will boost PRR coal traffic**

A new $100-million electric generating plant to be built near Watsontown, Pa. will mean a two-million-ton-per-year increase in coal traffic for the Pennsylvania. The Pennsylvania Power & Light Company facility, to be operative by 1972, will be supplied with fuel by PRR unit trains. The Barnes and Tucker Coal Co. will supply the coal from a new mine to be developed in central Pennsylvania. Unit trains carrying 14,000 tons of coal will shuttle between the mine and the generating plant on a 48-hour schedule. Estimates are that the PRR will supply 50 million tons of coal during the life of the plant.

# MONDAY MORNING REPORT

**IRT in Atlanta: Two object lessons**

When the Institute for Rapid Transit chose to hold its annual meeting in Atlanta last month, it served to dramatize one fact: The Georgia capital will soon come of age as a rapid transit city. When HUD officials chose the occasion to make some important announcements, it served to dramatize another fact: The transit industry as a whole will soon come back into its own again as a big-time operation on a national scale.

**Atlanta steps up transit plans**

On the surface of things, not everything is so rosy in either case. Consultants PBQ&D handed the Atlanta Metropolitan Planning Commission a favorable feasibility report on transit in 1962, and after five years, there are still no holes in the ground, let alone trains to run in them. But H.L. Stuart, general manager of the Metropolitan Atlanta Regional Transit Authority, had good news for IRT delegates assembled on his home ground: Things are looking up for MARTA in every sphere—political muscle, funding, a new tempo in planning.

**Target date—1973**

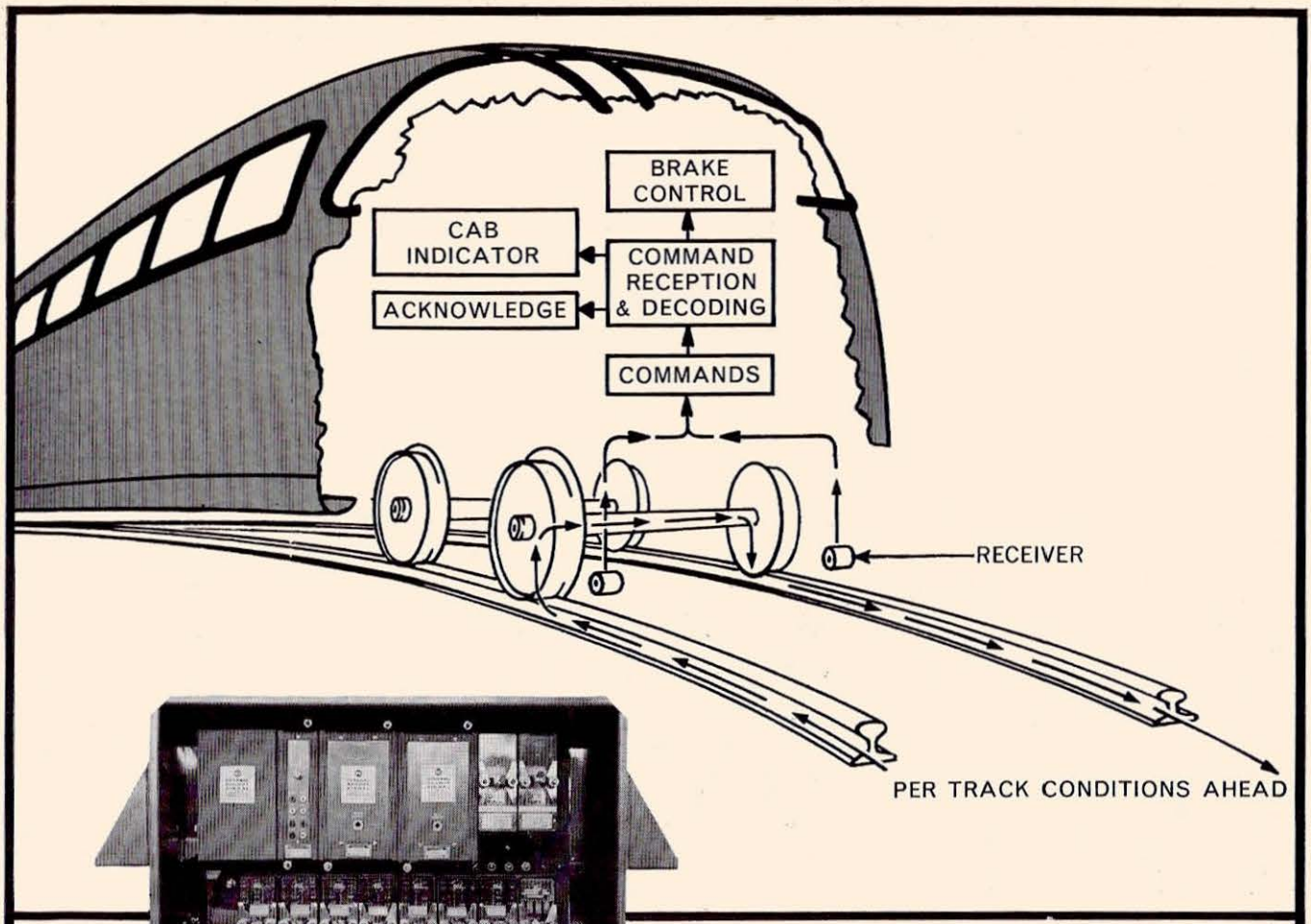
An enabling act passed by the Georgia General Assembly, he reported, authorized the state to finance up to 10% of the total cost of the future Atlanta system (Since then, state lawmakers authorized an initial $500,000 appropriation). City officials from Mayor Ivan Allen on down have been working energetically to get the public behind transit, with visible results to be seen in the lineup of influential citizens serving on the MARTA board and allied advisory groups. Parsons Brinckerhoff-Tudor-Bechtel, the joint-venture consultants, are busy updating the 1962 plans; they say that design work for the initial 44-mile system can be finished this summer, design for the entire 66-mile system by the end of 1968. At an IRT press conference, MARTA's Stuart estimated that the initial system might cost about $350 million, and be in service by 1973; another $90 million would be needed to bring the system up to its full length, some time around 1980. And, he added, for those who measure transit progress by hole-watching, the first holes will be dug early this summer: "We are doing some soil testing."

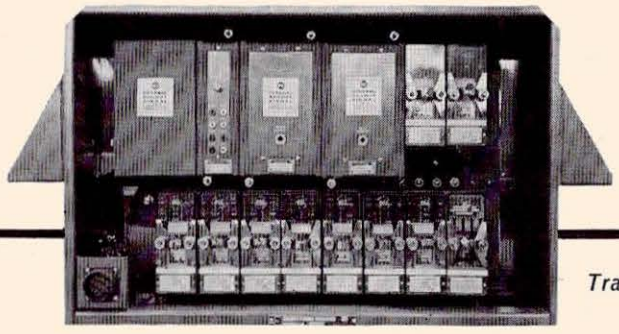
**The federal role**

One reason for MARTA's brightening picture is federal matching funds from HUD—$616,000 so far. HUD Assistant Secretary Charles M. Haar was on hand at the IRT meeting partly to spotlight this, but also to show how things are stirring all over the country. Just two days before, at a conference in Washington on design in urban transportation, Haar lit into the industry for having been stagnant too long. But that very meeting was called to display new design ideas cropping up on systems in Boston, Chicago, Philadelphia, not to speak of the brand new systems now under construction. By the same token, Haar used IRT's Atlanta forum to announce five research grants to foundations and private industry (on the heels of four awarded last March)—all for the purpose of giving transit men the most up-to-date tools for the job.

**A national test track?**

Nor did he stop there: Haar went on to propose creation of a national test track facility, somewhat on the lines of Bay Area Rapid Transit's Diablo test track, in order to put the transit R&D effort on a steady, continuing basis. "Now is the time to bring operators, suppliers, and HUD together," he said, "to set up a permanent experimental facility which will be available in the future. I would hope the IRT would take the leadership in such an undertaking. HUD stands ready to assist." Mass transit in Haar's view "is the leading edge of metropolitan development"—and stepped-up research will hone that edge quite a bit.



*Train-carried equipment case.*

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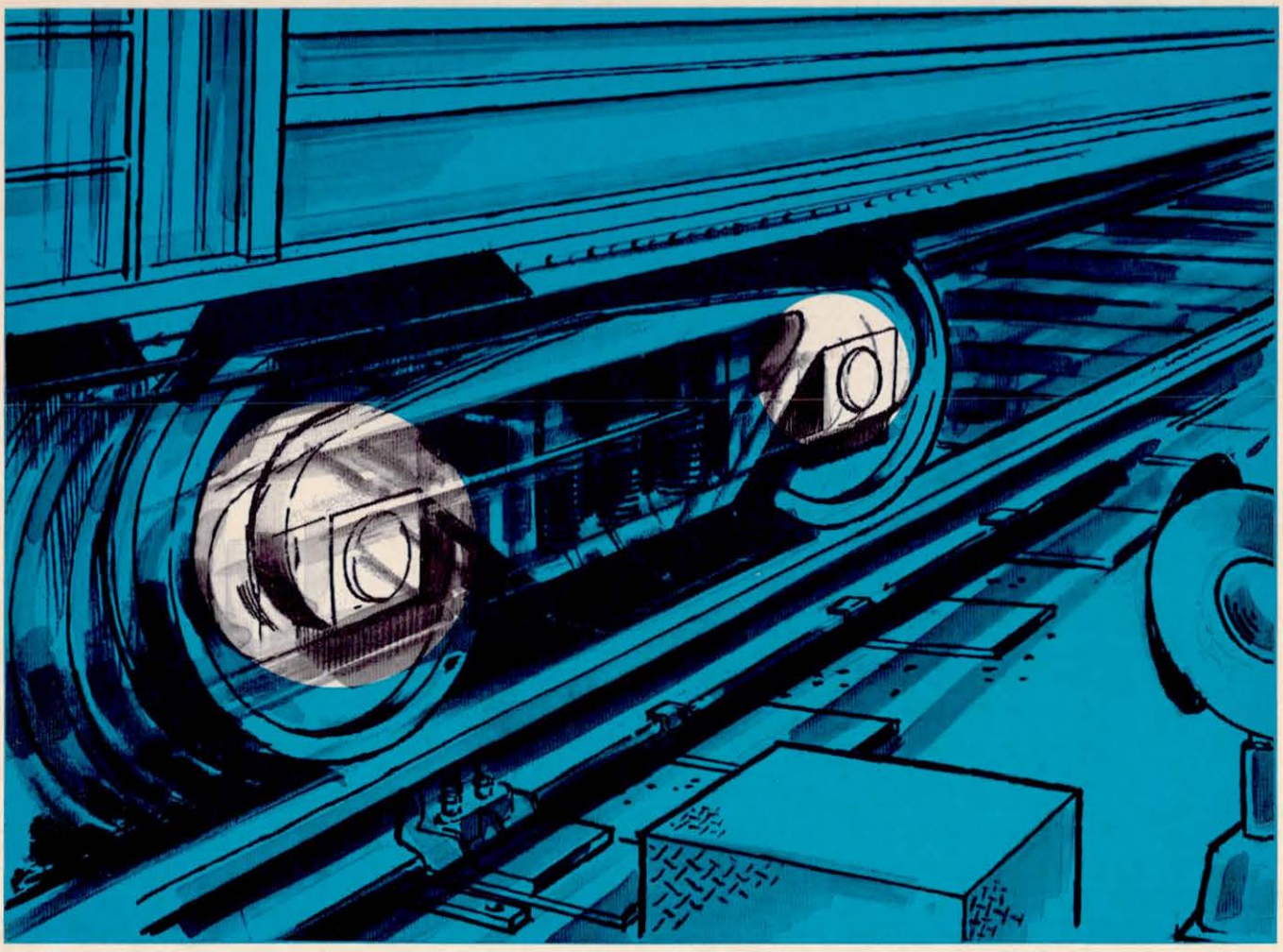

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# WEEK AT A GLANCE

## Car-buying: LBJ revises the forecasts

What effect will restoration of the 7% investment tax credit have on freight-car buying? Nobody knew for certain late last week—but as soon as President Johnson affixed his signature to the bill re-instating the investment incentive, a lot of educated guesses began making the rounds. A private survey made just prior to the tax credit's restoration indicated that railroads would immediately place orders for "several thousand" freight cars and "several hundred" locomotives.

Within 24 hours equipment orders did indeed begin to flow out of railroad purchasing offices. An early equipment order tally showed a total approaching $150 million. Among the early buyers were Norfolk & Western, Pennsylvania, New York Central, Soo Line, Union Pacific, MoPac, Frisco, and Atlantic Coast Line (See p. 61).

For the longer-range picture, estimates of orders for 1966 as a whole ranged from a low of 50-60,000 freight cars to a high of 75-80,000. Even the low figure would be a substantial gain over the early months of this year; only 12,231 new cars were ordered in January, February, March and April of 1967, compared with 44,835 in the corresponding months of 1966.

While the tax credit reinstatement came later than most industry observers had hoped, the bill that finally emerged was more favorable than had been expected. It provides that the credit will apply to all equipment ordered during the suspension period but not delivered before May 24, the day a Senate-House compromise on the legislation was reached.

Santa Fe President John S. Reed's comment seemed to be representative of industry reaction: "Of course, we are glad to know that the legislation restoring the investment tax credit has been passed, and we will be finalizing our orders for the balance of our previously announced 1967 program. This will have an immediate beneficial effect in that planning and placement of orders for 1968 deliveries need not be postponed until year's end."

## N&W takes inclusion case to court

The ICC's hope to authorize early consummation of the merger of Pennsylvania and New York Central may not be realized, because the Norfolk & Western has taken to court the Commission's decision requiring it to include Erie Lackawanna, Delaware & Hudson and Boston & Maine in its present system. The latest ruling of the U.S. Supreme Court on Penn-Central sent it back to the Commission to await finalized arrangements for taking care of E-L, D&H and B&M.

The Commission's decision was served June 12, and N&W acted promptly to file on the following day its appeal in the U.S. District Court for the Western District of Virginia, which sits in N&W's headquarters city of Roanoke. The decision, by Commission Chairman William H. Tucker, was a supplemental report in the case wherein N&W was authorized to form its present system by absorbing the former Nickel Plate, leasing the Wabash and Pittsburgh & Lake Erie and acquiring control of the Akron, Canton & Youngstown. That authorization was subject to conditions requiring N&W to take in E-L, D&H and B&M (if they asked for it, as they did) under terms found equitable by ICC.

Thereafter, however, N&W and Chesapeake & Ohio filed their pending merger applications with provisions whereby that proposed system would form a subsidiary to acquire E-L, D&H and B&M —and Reading and Central of New Jersey, too. N&W has contended that this is the equitable way to take care of those roads.

The Commission's present decision rejects that contention and undertakes to hold N&W to the inclusion conditions it accepted to get clearance for its present system. The decision was accompanied by a related one—a supplemental decision in the Penn-Central case. This affirms conditions requiring Penn-Central to idemnify E-L, D&H and B&M for revenue losses they may suffer if they fail to find a home before that proposed system gets in business.

Meanwhile, it rejects proposals that capital-loss indemnities should also be imposed.

N&W's appeal in the inclusion case asks that the Commission's order be stayed by a temporary restraining order, if necessary, and then by a permanent injunction. July 17 is the effective date of the Commission's order as now issued.

## Container service—Japan-U.S.-Europe—to begin

The prospect of shipping container cargo from the Far East, across the U.S. to Europe has been a topic for discussion at recent transportation conferences (RA, June 5, p. 8). Now it's going to become a reality .

Last week, United Cargo Corp. announced plans to begin regular container shipments over the route. Cargo packed in Yokohama will be shipped to Seattle, then by rail to New York, and then on to London or Rotterdam by ship for distribution in Europe.

United Cargo officials said the route across the U.S. would permit cargo to he moved from Japan to Western Europe in 26 to 28 days, compared with more than 40 days via conventional steamship service using the Suez Canal.

Meanwhile, in New York, longshoremen were making rumblings that could spell trouble for container operations in general. Dock workers say they intend to use a recent Supreme Court decision on prefabrication to limit the use of containers in shipping ocean cargo. The decision said a union could legally strike to block automation of its members' jobs.

On the prefabrication issue, the union is said to have taken the position that all containers would have to be opened, emptied of cargo and then reloaded at dockside. A local union official is quoted as saying that the union will demand that "no ILA member covered by the collective bargaining agreement in any ILA port will receive, handle, check or work on any containerized cargo where the cargo . . . has been placed therein prior to the container or pallet having been placed on the job site."

## GUS WELTY'S LINES ON LABOR

WELTY

**IT'S TIME** for the annual fling with figures—those small-print figures on wages and employment which turn up in the ICC Bureau of Accounts' Statement No. A-300. And what do the figures show for 1966? Among other things, they show workforce stability to a degree unequaled in more than a decade. They also show net increases for many classes of train-and-engine service. And, of course, they show another increase in total compensation paid, which went from $4,793,-066,449 in 1965 to $4,879,273,379 last year. The straight time paid for, however, was not so much a factor on a percentage basis of increase as was overtime. Straight time compensation was up by $40.2 million, or about 1%, from 1965; overtime climbed by $31.3 million, or close to 9%.

**TOTAL EMPLOYMENT,** based on mid-month averages, declined by only 9,066—the smallest drop recorded since 1954-55. Off-train transportation employees (ICC Group V) took the biggest cut. But employment levels remained fairly even, 1965-66, among other transportation employees and, perhaps surprisingly, among maintenance-of-way people.

**AMONG THE OPS,** elimination of firemen was the only major factor preventing an actual increase in T&E employment. The count shows 1,906 fewer road freight and yard firemen on the rolls—but the group as a whole showed a decline of only 700 employees. And the train-and-engine-service group accounted for about $26 million of the over-all $76 million increase in total compensation paid.

**FIGURES ON THE OPS** should be somewhat heartening for such as the BLE, BRT and ORC&B, if not for the BLF&E and SUNA. Increased employment was reported in '66 for road freight conductors and foremen; and for road freight and yard engineers. The demand for yard brakemen and helpers fell off slightly, as did the demand for all classes of operating employees in passenger service.

**WITHOUT MUCH DOUBT,** two big factors were at work last year to tend to soften the continuing decline in employment. Stabilization agreements were having their effect. And, simply, business was better in '66. But, while one packs away the A-300 statements for another year, one has to wonder what the new figures will show at this time next year. Stabilization agreements will still be around (and a number of unions are pushing for even greater job security). But business, at this point, isn't stacking up so well. Carloadings are down, the ton-mile figure is down, net income is down, labor costs are continuing to climb. And that combination of down-and-up elements, if it holds, will make stability tough to maintain.

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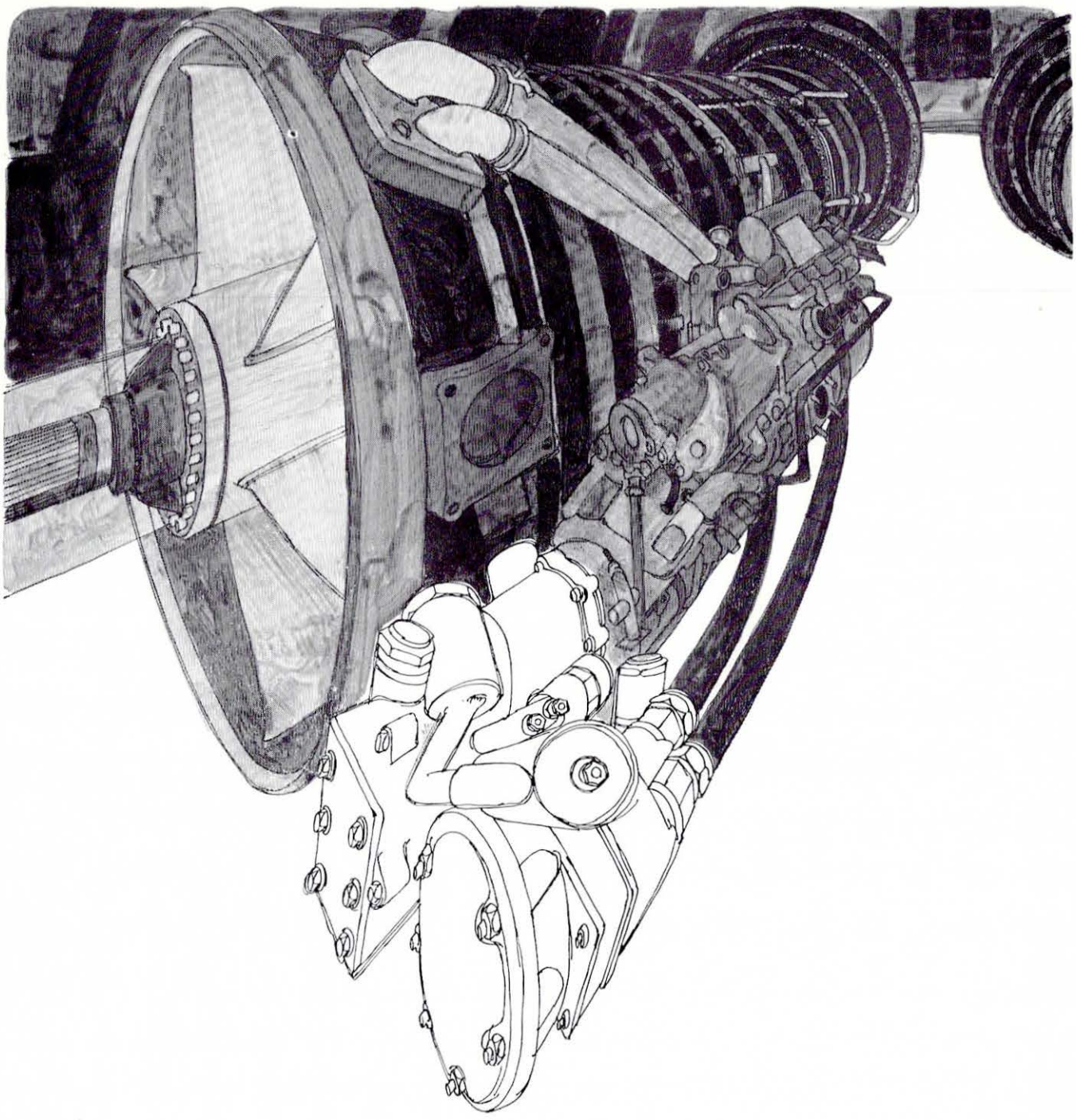

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# Drag or race!

Sixty-five new General Motors locomotives on the Pennsylvania are delivering a new kind of power flexibility. These 3600 horsepower units can speed a TrucTrain or drag a heavy unit ore train, either at a moment's notice. They give the Pennsy a more efficient, versatile motive power fleet and guarantee that the freight—regardless of classification—will get there on schedule.

GM
MARK OF EXCELLENCE

**Electro-Motive Division**
La Grange, Illinois

# For modern railcars...

# The jet-inspired Garrett-AiResearch air comfort system.

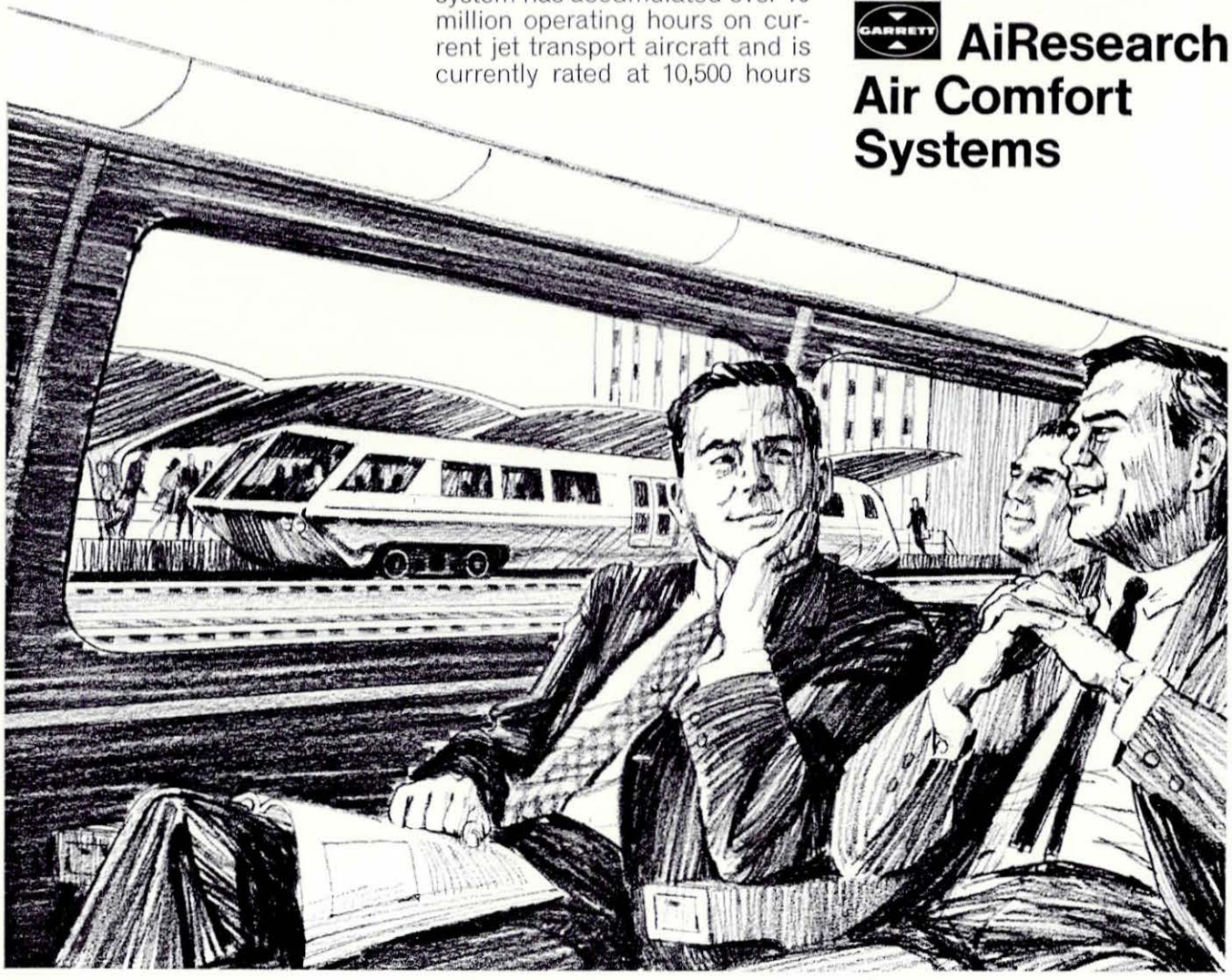
The Budd Company's new "Turboliner" RTC is advancing the technology of railcar design: it features lightweight, high performance Garrett gas turbines for propulsion, and a jet aircraft-inspired air comfort system.

This system is one-half the size, and one-fifth the weight of conventional railcar units. It incorporates such advanced design features as 400 cycle power—which further reduces electrical subsystem weight—yet it remains comparably priced with other systems in use today. It can be installed overhead or under the floor, and quick-change modular design makes servicing easy.

The AiResearch air comfort system for railcars is a direct outgrowth of our environmental systems flying on most of today's jetliners. This lightweight Freon system has accumulated over 10 million operating hours on current jet transport aircraft and is currently rated at 10,500 hours between overhauls. The high speed lightweight compressor is the heart of the entire system. It has a mean time between malfunction of over 70,000 hours.

AiResearch can custom-design a complete railcar air comfort system to your specific requirements. For complete details, write: AiResearch Manufacturing Division, 9851 Sepulveda Blvd., Los Angeles, California 90009.

**GARRETT AiResearch Air Comfort Systems**



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# Anchor® shoes will be on the run

**between Montreal and Toronto**

One of the first regularly scheduled, high-speed trains to go into service in North America will operate between Montreal and Toronto. Designed for maximum passenger comfort, the new United Aircraft developed TurboTrains will complete the 335 mile run in less than four hours. This is 20% faster than the present Canadian National Rapido, described as the fastest intercity passenger train now operating in North America.

The speeds attained by the new TurboTrains (95 mph initially—120 mph eventually) and the lack of dynamic braking put maximum emphasis on brake shoe performance. This is why Anchor On Tread Composition Brake Shoes were chosen.

Anchor Shoes offer the characteristics needed to stop the train of the future . . . a uniform coefficient of friction throughout the speed range, reliable braking performance under all normal operating conditions, and uniform wheel wear characteristics.

***WHY SETTLE FOR ANY BRAKE SHOE WHEN YOU CAN HAVE TOMORROW'S PERFORMANCE TODAY?***

GRIFFIN® WHEEL COMPANY
445 N. Sacramento Blvd., Chicago, Ill. 60612
In Canada: Griffin Steel Foundries, Ltd.
ONE OF THE Amsted INDUSTRIES

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# Headway Shrinker

## WABCO'S Systems Capability Doubles DRPA's Passenger Capacity

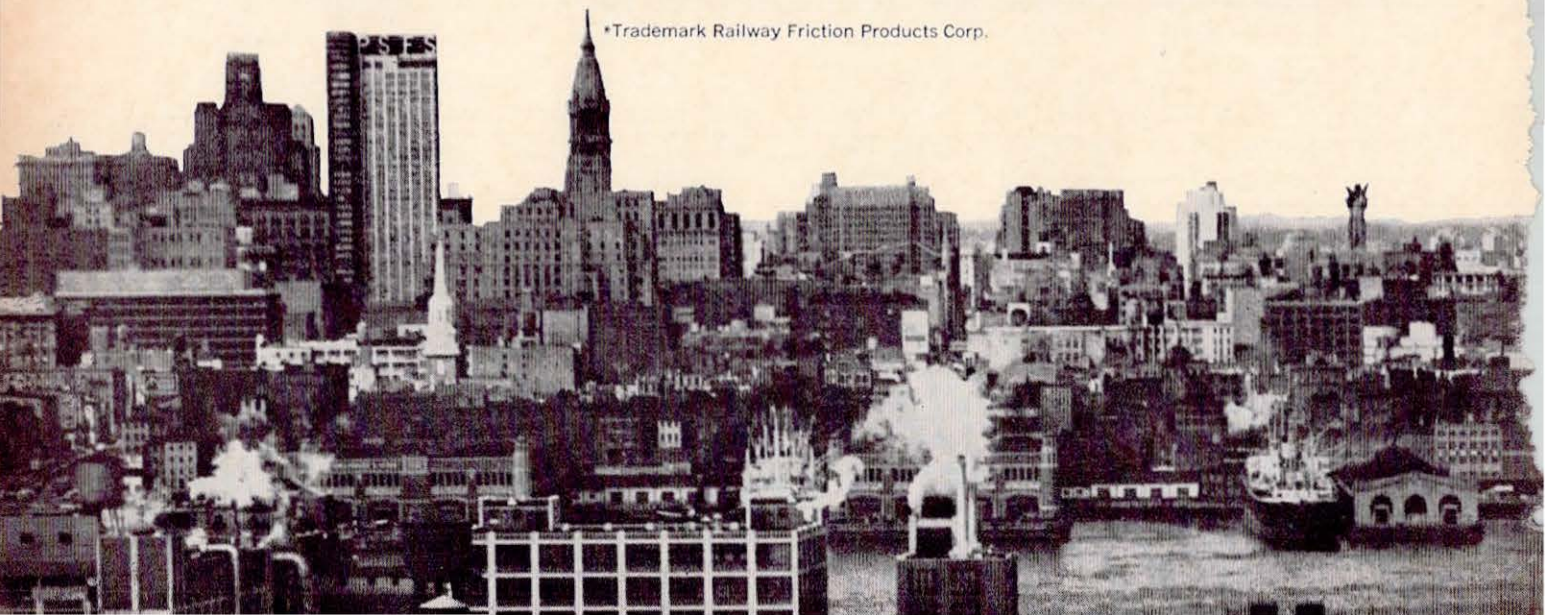
Trains for the ultra-sophisticated Delaware River Port Authority transit system will be equipped with WABCO Automatic Couplers, governed by WABCO's Automatic Train Operation (ATO), and stopped smoothly and reliably by a WABCO Braking System. Because the ATO automates train spacing, dispatching, routing, starting and stopping, DRPA's highly advanced facility will deliver twice the standard service with the same number of trains.

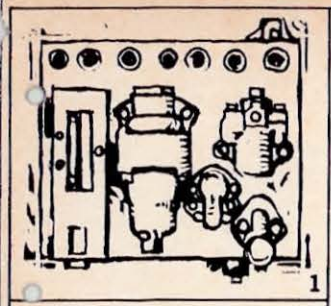
WABCO-designed wayside and train-carried equipment make possible a speed-up in command communications that sharply reduces headways. As inputs are fed into the ATO they are immediately converted into commands for optimum speed. deceleration, dwell time, train announci[illegible]and other functions that are now performed manually. The control center is for monitor purposes only—"management by exception." And the system is absolutely fail-safe.

WABCO's RT-5 Electronic Braking System, "G" Tread Brake Units and COBRA* Brake Shoes combine solid state control technology, pneumatic "muscle" and longer-life superior composition friction material for quiet, positive, comfortable deceleration.

**Result: a system so carefully integrated that it provides a 25% reduction in invested capital and maintenance.**

*Trademark Railway Friction Products Corp.

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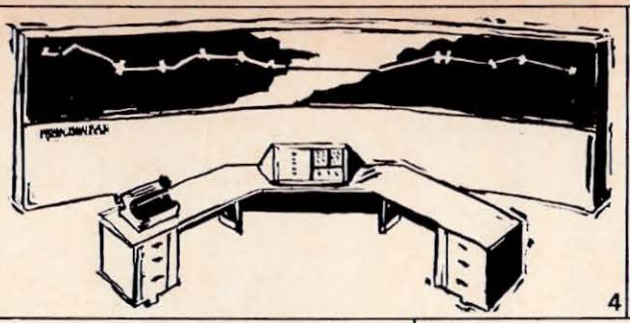
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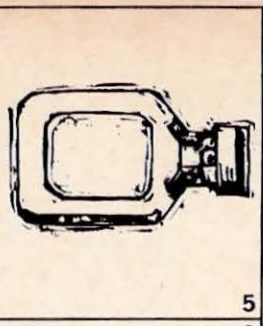
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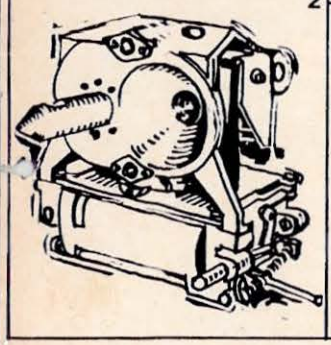
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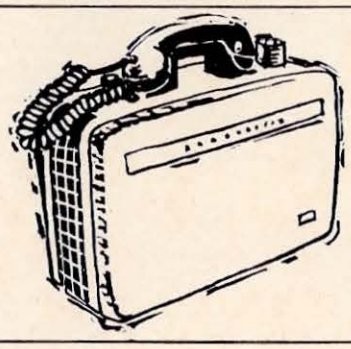
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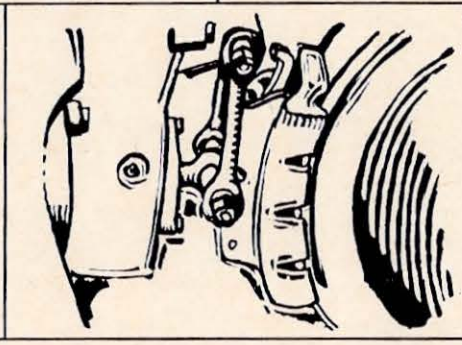
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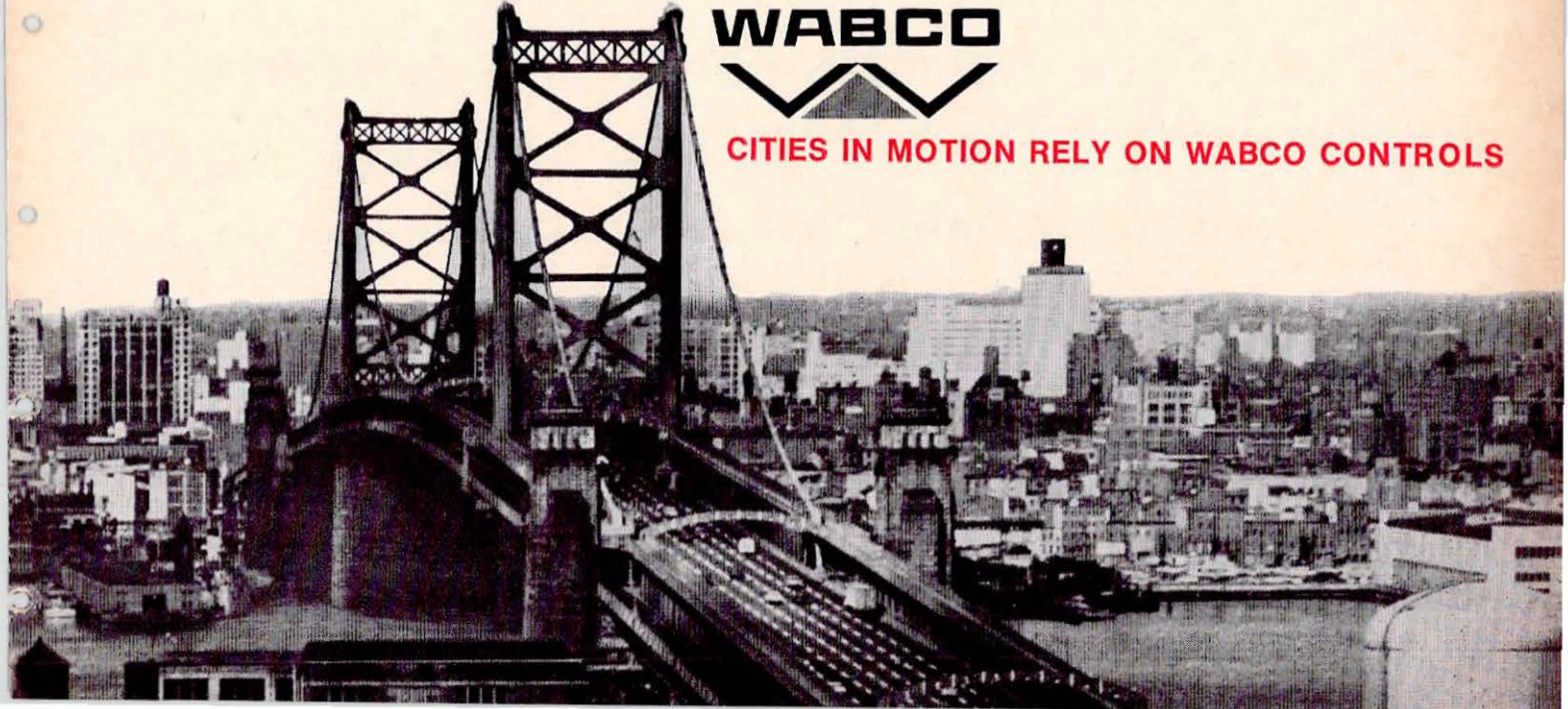
## WABCO "building blocks"—stepping stones to automated mass transit systems.

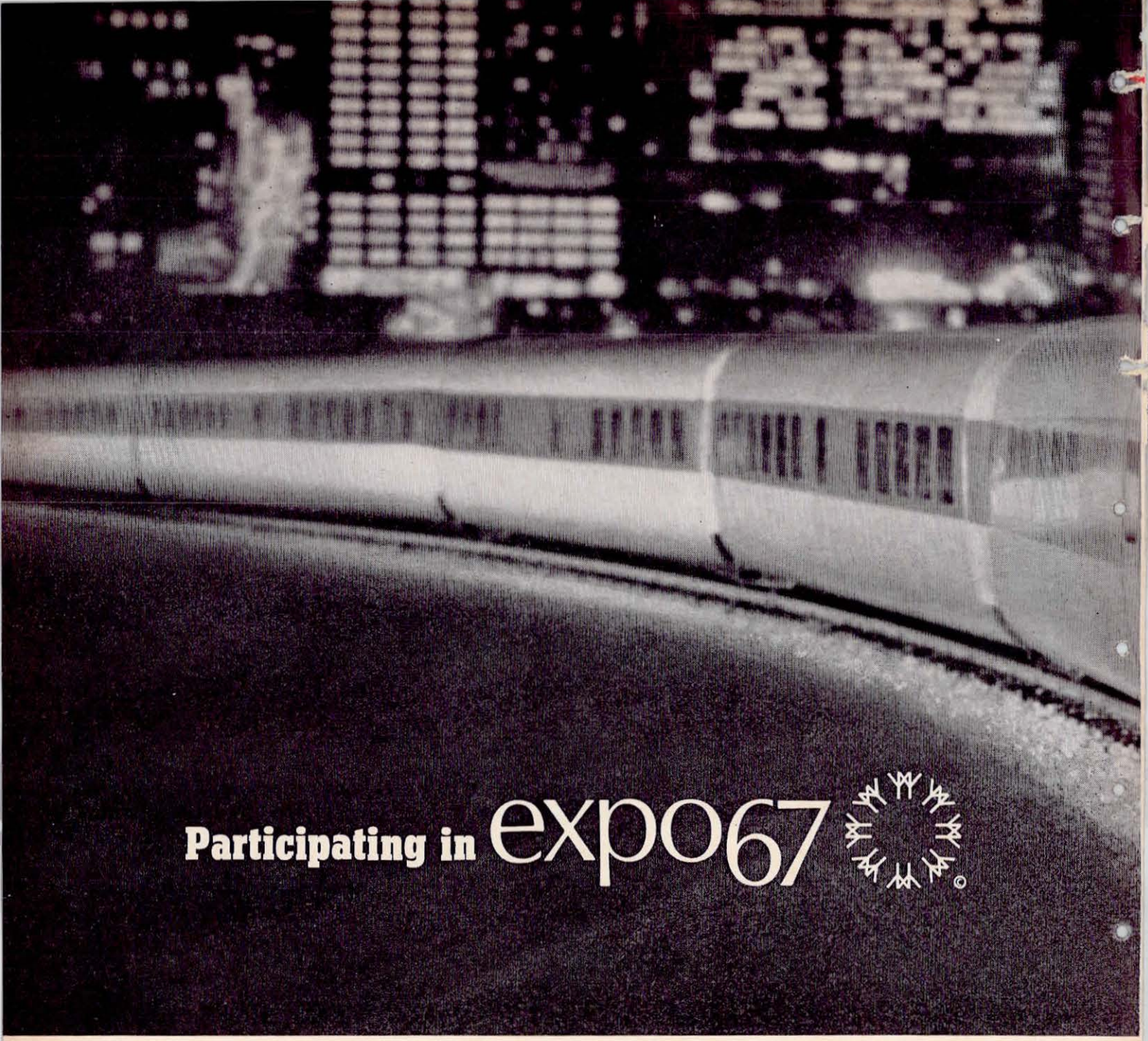
1. The G-type Pneumatic Operating Unit provides an infinitely variable control, instantaneously converting electrical impulses into pneumatic force for brake control pressure.
2. WABCO's N-2 Automatic Car Coupler locks in all mechanical, electrical and pneumatic connections simply by bringing the cars together at coupling speed. Built-in benefits include up to 70% weight reduction over previous standard automatic couplers, automatic brake application in unintentional parting of couplers, and 125 fewer parts.
3. Trainphone, a two-way communications package, provides continuous vocal contact between train attendants and control center.
4. DRPA's Master Control panel enables the supervisor to take in the entire system's operation at a glance.
5. WABCO's Identra® equipment automatically identifies each train at wayside locations to insure correct routing to its destination.
6. COBRA* Brake Shoes last longer, substantially reduce wheel wear and provide 50% better riding quality than off-tread braked wheels.
7. Wayside Transmitters send coded AC impulses along insulated steel rails. These impulses are picked up by train-carried equipment which decodes them and converts them into input commands.

*For details on WABCO's combined massportation capabilities, write Mass Transit Center, Westinghouse Air Brake Co., Pittsburgh, Pa. 15218.*

WABCO

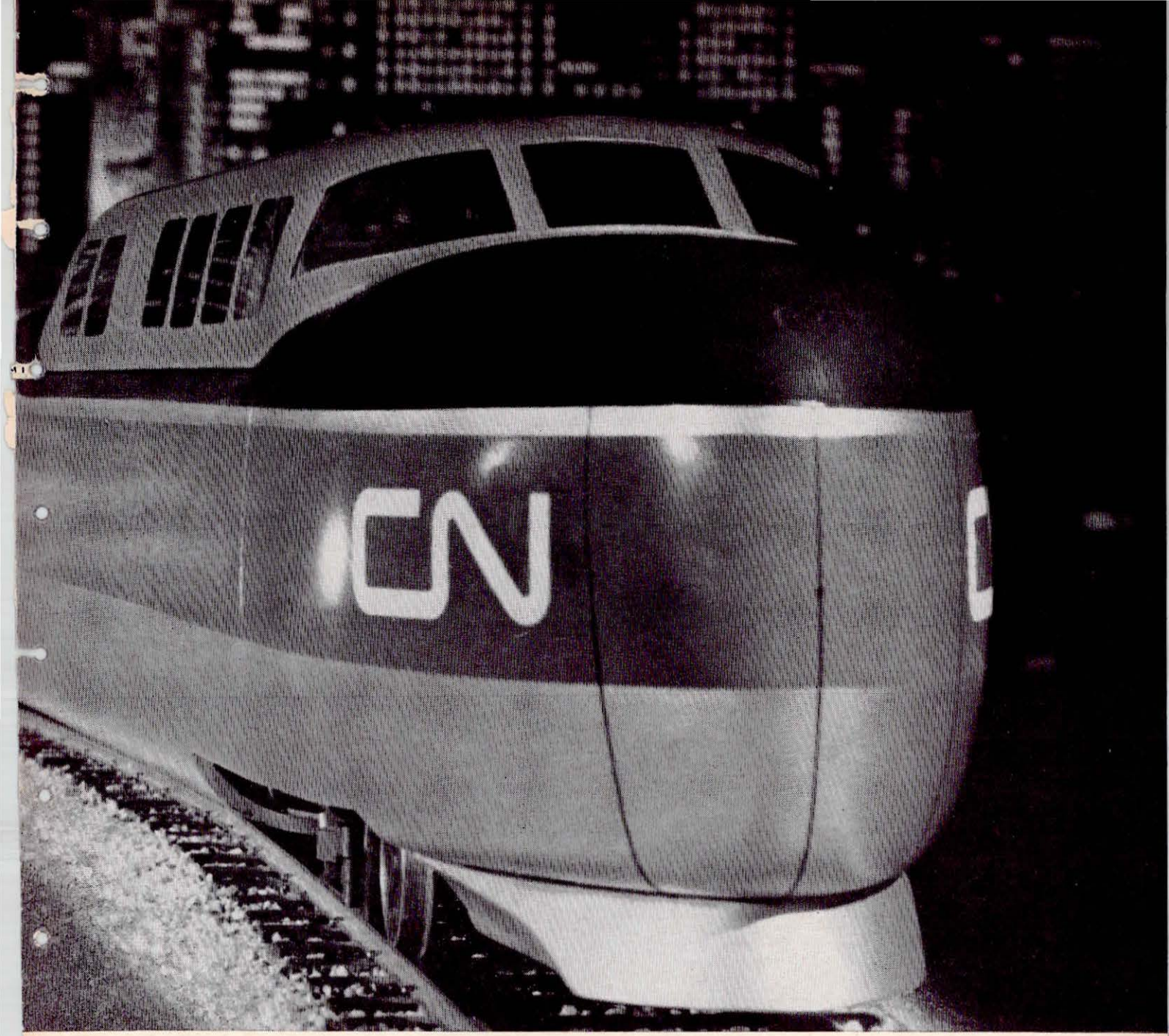
CITIES IN MOTION RELY ON WABCO CONTROLS






# Five new Canadian National turbotrains roll after big share of Toronto-Montreal passenger traffic

**100% ON RELIABLE TIMKEN® AXLE BEARINGS**




Canadian National Railways is ready for Canada's Centennial Year and Expo '67.

The CN ordered five, 7-car turbine-powered trains, designed by United Aircraft Corporate Systems Centre, Division of United Aircraft, and manufactured under agreement by Montreal Locomotive Works, to carry this big traffic at high speed, day-after-day. All axles will turn trouble-free on Timken® tapered roller bearings.

Every day, thousands of people will shuttle between Montreal and Toronto on the revolutionary system. With these new trains, Canadian National will provide comfortable, fast transportation—and at low cost. The new turbotrains will make the 335-mile run at speeds approaching 100 mph.

Timken bearings have already been tested on railway equipment at more than 200 mph. High-quality steel, remarkable precision, the tapered roller design and engineering service are reasons why Timken bearings are specified for most of tomorrow's high-speed inter-city rail systems.

The Timken Roller Bearing Company, Canton, Ohio. Timken bearings sold in 116 countries, manufactured in Australia, Brazil, Canada, England, France, South Africa and U.S.A.

**TIMKEN®**

**TAPERED ROLLER BEARINGS**

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Canadian National Railways' TurboTrain

Delaware River Transit Run

New York-Washington Corridor Project

# Six revolutionary high-speed rail projects—all with Standard Steel wheels

**Long Island Railroad**
**Turbine-driven Railcar**

**Bay Area**
**Rapid Transit Project**

**New York Central**
**Jet Rail Test Car**

Trains that whisk to speeds of 160 miles an hour. Rail test cars that zip to 184 miles an hour. The first gas turbine railcar . . . the first jet-driven railcar . . . the first high-speed, fully automatic commuter trains—all roll on tough, forged wheels by Standard Steel.

At Standard Steel this kind of progress is a tradition. You can find it everywhere. In general wheels. In workhorse wheels for freight cars. In diesel wheels. In exotic wheels, including the quietest wheel made today—the new ACOUSTA FLEX wheel.

Standard Steel wheels are worth your consideration today for tomorrow. For more information, write Standard Steel Division, Burnham, Pa. 17009.

**BALDWIN·LIMA·HAMILTON**
A subsidiary of Armour and Company

**BLH**
**STANDARD STEEL**

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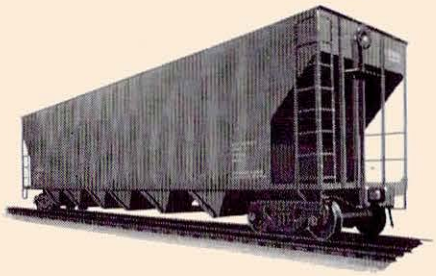
# ARE YOUR CARS ASKING FOR DAYS OFF?



## They'll work overtime and then some with NDH Bearings.

Your cars will put in more working days when they roll on NDH taper freight bearings. That's because NDH Bearings are put together with watchmaker's precision and accuracy.

For example, we keep the diameter, length and angle of the rollers within precisely controlled limits, to ensure maximum capacity and true rolling. We don't allow width increments in spacers to vary more than .005". If spacer ends lack as little as .001" of being parallel, out they go. And we hold the surface grinding of inner and outer bearing races to extremely close tolerances. This helps achieve a precise journal fit and proper operating characteristics.

Our extra attention to detail seems to pay off. NDH Bearings (Hyatt Taper Freight Bearings) have rolled up 2½ billion miles of trouble-free service.

Keep your cars working full time. Specify NDH Bearings.

NDH NEW DEPARTURE · HYATT BEARINGS
DIVISION OF GENERAL MOTORS CORPORATION · SANDUSKY, OHIO

GM
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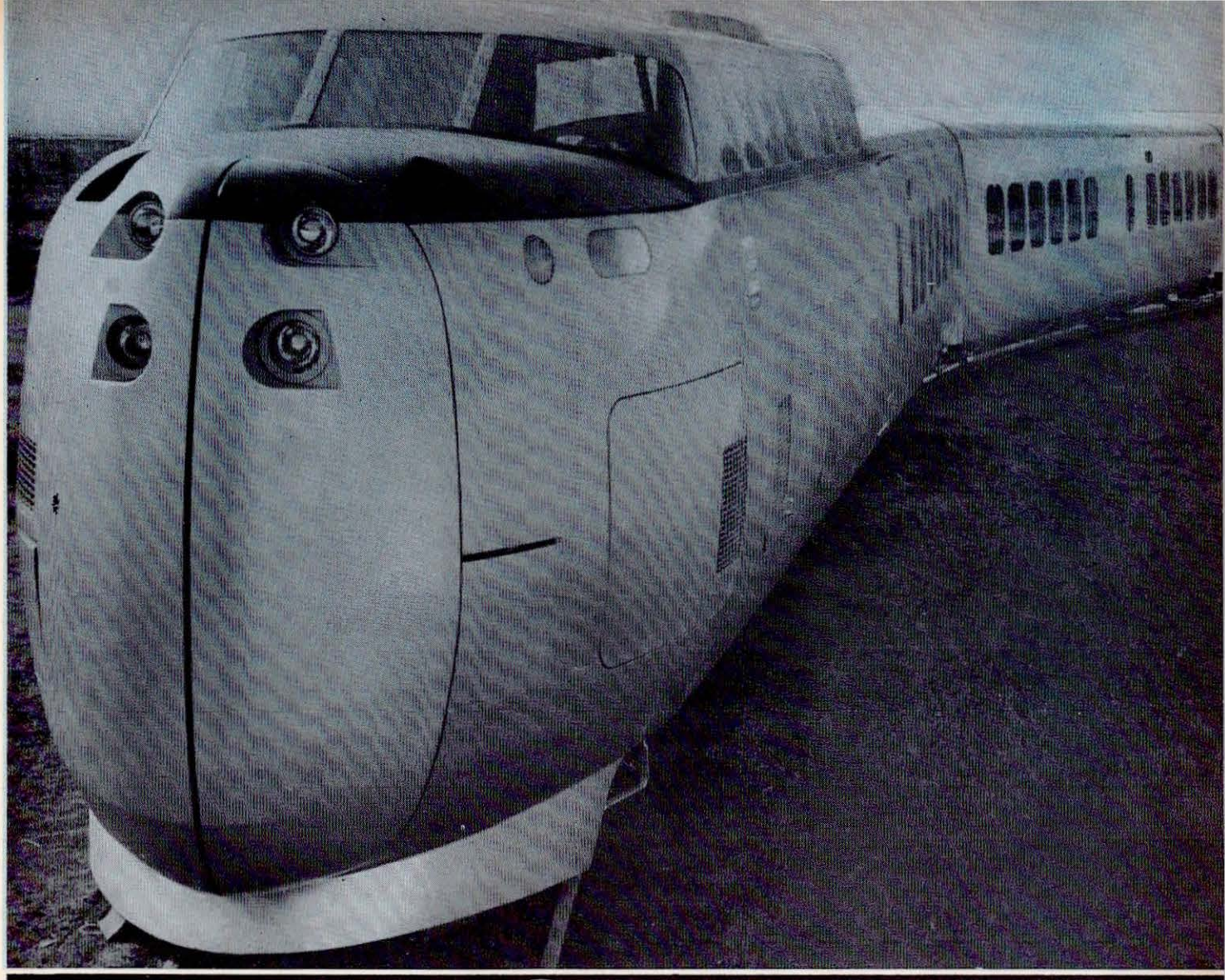
# NDH BEARINGS



# TURBOTRAIN

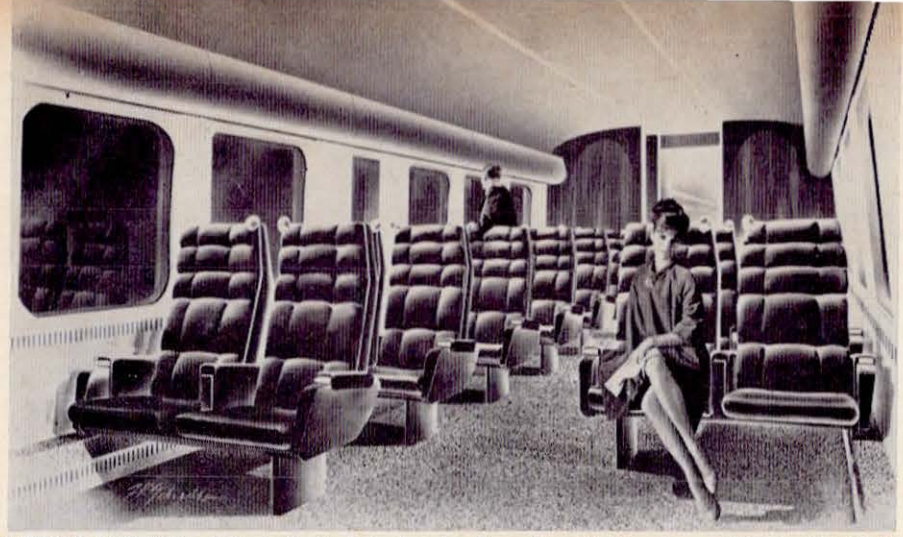
## Can it put profit in passengers?

**United Aircraft has made a multi-million dollar bet that a real 'systems approach,' plus some aerospace technology, can re-ignite a field marked mostly by 'flame out.' U.S. and Canadian pilot operations will soon show if this is enough.**

By F. N. HOUSER

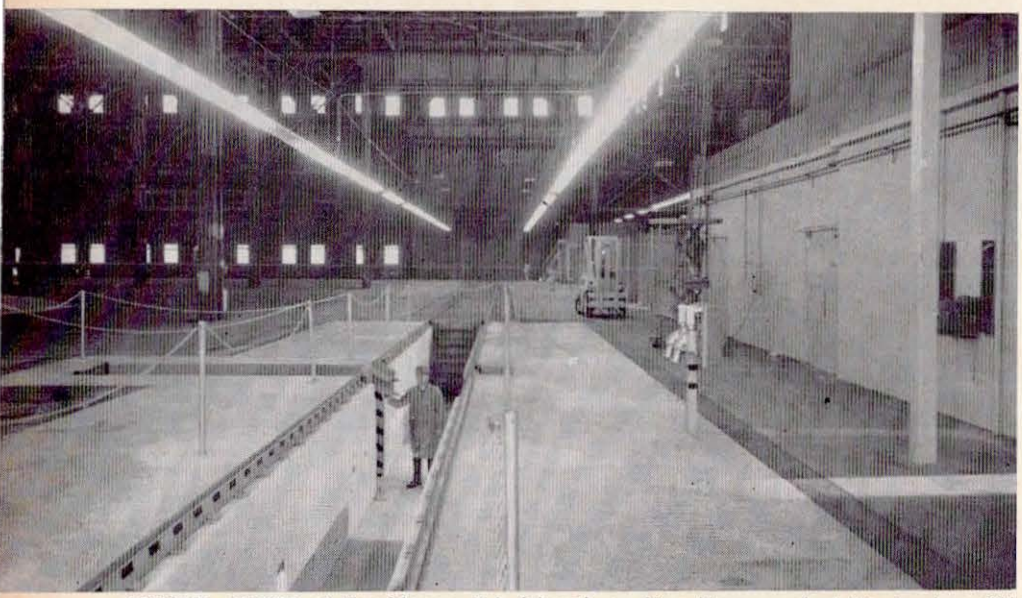
High speed, high style, high availability. . .these features which aerospace-oriented United Aircraft has strived to incorporate in its new TurboTrains will soon be put to the test. Are these the elusive factors which might, at last, render profitable some phases of North American rail passenger service?

No one knows just yet. All that is certain so far is that the first three-car UA trainset to be completed has spent the past few weeks successfully traversing at low speeds the serpentine yard trackage around Pullman-Standard's Chicago passenger car plant. Next on its schedule will be appraisal on the Rock Island at speeds to 110 mph and



**LAVISH LUXURY** of TurboTrain interior for Canadian National, combined with high speed on Montreal-Toronto runs, is to be offered at higher-than-standard fares.

## System segments: Style and utilization



**SPECIAL SHOPS** at Providence, R.I. (above), on New Haven and at Montreal on CN will be supervised by United Aircraft; aim is to maximize availability and earnings.

then runs to 160 mph on the government-financed test track in New Jersey.

● **System, not just speed.** That there is more to filling the seats in a train than merely running it fast is readily conceded by UA marketing specialists and engineers. And making a buck for the train's operator in the process constitutes still another enigma. A systems approach is the UA answer to the quandary.

"The best hope for the survival of railroad passenger service is a system which can be operated at a profit," explains Robert H. Shatz, vice president of United Aircraft Corporate Systems Center. "This is the aim of United Aircraft."

There actually will be two different proving grounds for the UA concept. After revealing its design for the gas-turbine-powered, articulated aluminum trainsets about 18 months ago, UA received commitments for two groups of trains.

● **Northeast Corridor test.** The U.S. Department of Commerce ordered two three-car versions as a phase of its Northeast Corridor research and demonstration programs (RA, Feb. 21, 1966, p. 47). Because administration of the Northeast Corridor project has since been transferred, the Department of Transportation will actually take delivery under the $2.1-million contract. It is one of these trainsets which has been undergoing tests in the Chicago area.

Late this summer both trains are to begin demonstration revenue runs over the New Haven between Boston and New York City. Inaugural dates are still indefinite, hinging primarily on successful completion of road tests by the train which is now out of the Pullman plant. If there are no problems it will return to the factory for application of the interior lining and furnishings. Meanwhile, the second train will be pushed to completion by P-S, which has acted as a UA subcontractor in fabricating and assembling both.

● **No infancy.** TurboTrain seems destined to make the Canadian scene virtually full grown. Canadian National, which rates the design as "the greatest advance in railway technology in the past century," committed for five seven-car trainsets on a lease-maintenance basis from United Aircraft of Canada.

After two postponements resulting from delays in delivery of components, CN's trains are now scheduled to begin three daily trips in both directions between Montreal and Toronto on October 29. Initially the trains will be timed to average 84 mph, cutting a full hour from the schedule of the Rapidos, currently the fastest conventional trains not only on this 335-mile run but in all of North America.

The Turbos, as CN will know its new trains, are being built by Montreal Locomotive Works under contract from UA. They will be delivered under a contact which shares the experimental costs of the project between CN and United Aircraft; the railroad has an option for outright purchase over an eight-year period. CN's investment reportedly could be about $10 million.

● **Higher speed, lower cost.** Fast schedules require higher speeds, improved acceleration and faster braking. Simply adding horsepower says UA, does not solve the problem of ride comfort at high speed, nor does it reduce operating costs.

UA has chosen to reduce train resistance rather than increase power to produce a given level of performance. Resistance is lowered in four ways:

—Weight is cut in half by eliminating locomotives and reducing the weight of cars through use of aluminum structures and lightweight auxiliaries;

—Aerodynamic drag, an increasing factor at speeds above 80 mph, is reduced with the long "aspect ratio" of the nose, the smooth exterior including underbody, the flush windows and doors, and the full-width diaphragms;

—Single-axle suspension with positive steering aims to eliminate hunting on tangent track and make possible curve negotiation without flange contact;

—Minimum number of wheels and axles achieves low rotating mass which must be accelerated and braked.

Gas turbines will give the trains installed power ratings greater than those of electric locomotives. Interiors will be much like those of contemporary jet planes.

# TURBOTRAIN

# Turbines, suspension are crucial elements

## Keys to how fast, how well aluminum trainsets will ride.

**ALUMINUM ALLOYS** in thicknesses up to 1 inch are assembled to produce smooth exterior with minimum of aerodynamic drag but full strength required by AAR.

The basic configuration of all TurboTrains is the same—a power dome car at each end with a variable number of intermediate cars between. Each of the five Canadian National trains will have five intermediate units between the two domes. The two U.S. Department of Transportation trains have only a single coach between two power cars.

● **Beneath and between.** But it is what is beneath the domes and between the cars that really counts. Here are the mechanical components on which the TurboTrain's success literally rides. Beneath the domes are the high-powered gas turbines and gear drives which propel the train; between the cars are single-axle suspensions that do not have a precedent of overwhelming success in North American railroading.

United Aircraft, in designing its TurboTrains, has worked to counter any problems which turbines' inherent high fuel consumption might produce and to achieve an unprecedented level of comfort and satisfactory operation from the suspensions.

● **Keys to development.** With their variable lengths and interior arrangements, UA regards TurboTrains as a family which can be fitted for services as diverse as commuter operation and medium-distance intercity runs. In every case, say the designers, "gas turbines and other advanced components are combined to obtain high speeds without affecting passenger comfort or train stability."

Interiors of the cars will be tailored to fit the travel market for which the train is intended. The three-car D.O.T. trains, which will be tested on the New Haven between Boston and New York, will have a capacity of 156 passengers —54 in each of the pair of dome coaches and 48 in the intermediate coach.

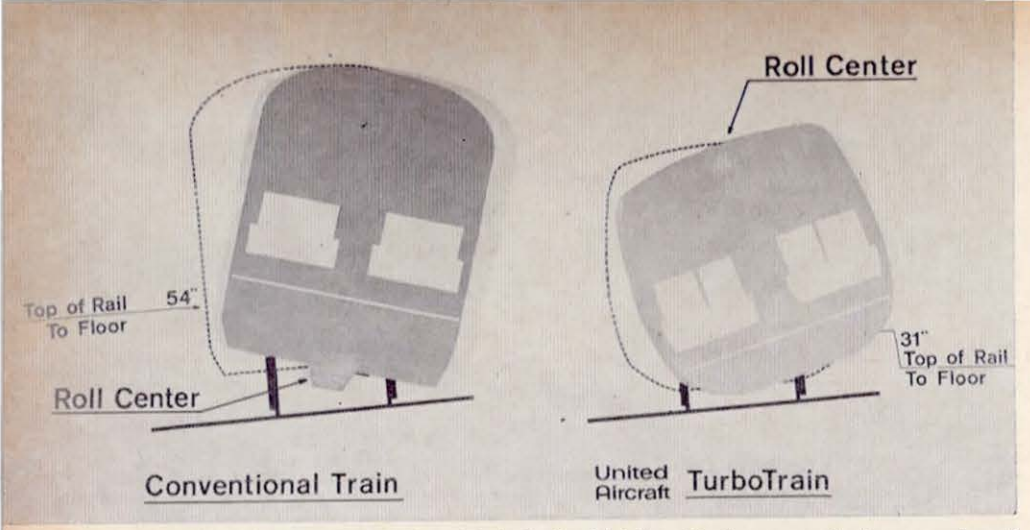
● **Tandem trains.** Canadian National, which will schedule its TurboTrains to operate in 14-car tandem sets three times daily in each direction on the 335-mile Montreal-Toronto run, will make a pitch for both coach and first-class traffic. Each such train will consist of two club dome cars and two club cars for the first-class trade, and six coaches, two cafe coaches and two bar dome cars for coach passengers. The train will have a capacity of 600.

Club car passengers will be served refreshments and meals at their seats by hostesses and stewards. Coach passengers will be able to purchase food at the cafe counter. Each passenger will have his own fold-away table tray at his seat.

● **Jet-like interiors.** The jet-like interiors of the cars will incorporate reclining seats with individual arm rests, carpets, drapes, and air conditioning that accommodates smokers without annoying non-smokers. UA worked with the industrial design firm of Raymond Loewy-Wm. Snaith in the styling of the car interiors.

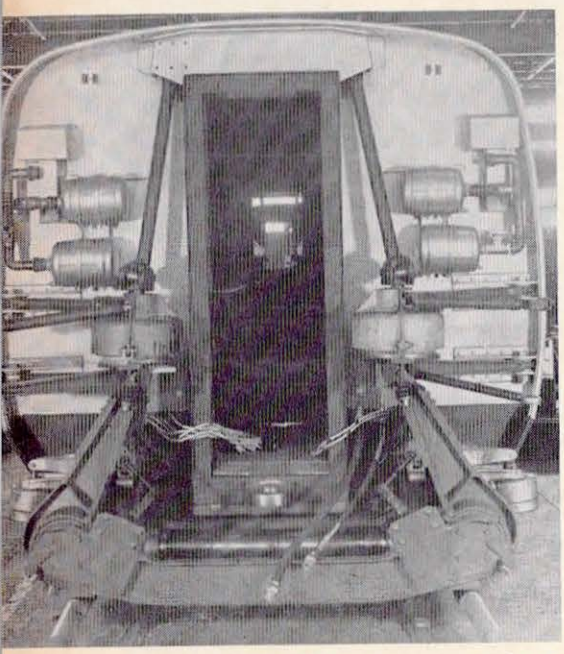
To render passenger service profitable, it must not only be attractive to potential customers from comfort and fare standpoints, but must make it possible for railroads to cut operating costs and minimize investment while affecting freight operations as little as possible.

Having decided to cut resistance and weight (see p. 26) rather than add horsepower, UA turned to a lightweight prime mover, the ST-6 gas turbine developed by United Aircraft

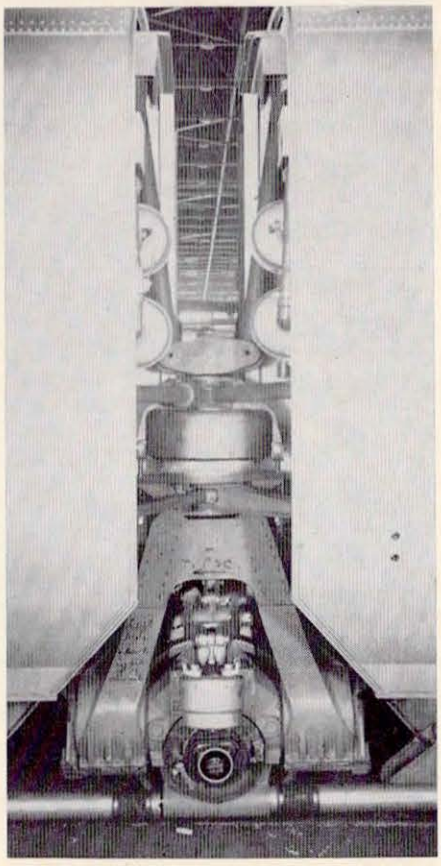



**PENDULOUS SUSPENSION** of TurboTrain (right), with its support above center of gravity produces inward banking on curves, contrasting with standard car.

## Single axles, unusual suspension will be watched closely

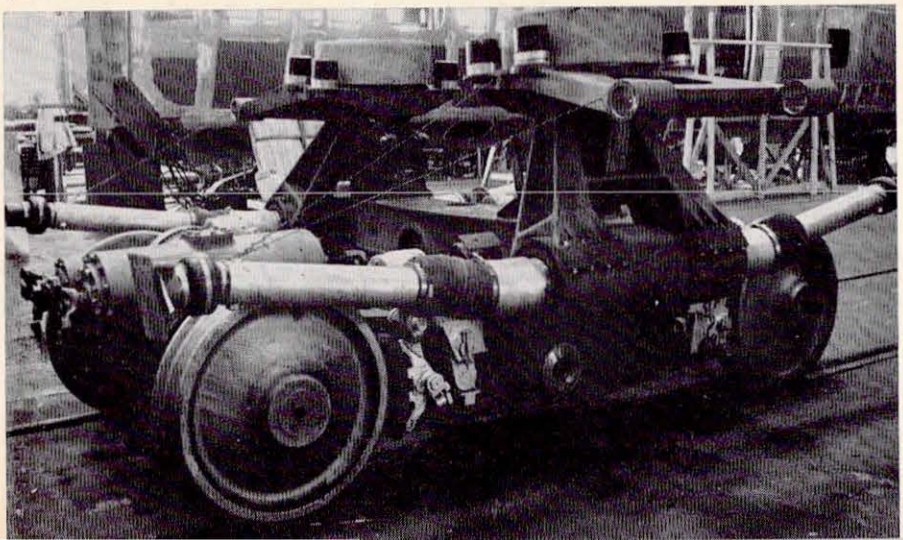


**SPRING SYSTEM** has separate units to cushion vertical and lateral forces.



**SINGLE AXLES** between cars are guided by "turnbuckles" to bisect curve angle.

**TWO-AXLE TRUCK** which goes under front of power dome car has high support points and has cardan shafts to double-reduction gear boxes on both axles.



of Canada. This engine, based on a similar unit used in aircraft, burns conventional diesel fuel and has an output of 400 hp continuous with a weight of about 300 lb.

● **No transmission.** This particular turbine is known as a "free shaft" type in which the output shaft is separate from the turbine stage driving the compressor. The free turbine is an aerodynamic torque converter requiring no conventional transmission. It is so compact that sufficient engines can be installed on any TurboTrain to produce the specific performance required of the projected service.

On the 14-car CN train, there will be eight turbines for traction, rated at 2,400 hp, and an additional four turbines of the same type for generating auxiliary power for all on-board services, including heating and air conditioning. The auxiliary power turbines drive three-phase alternators with the a-c current trainlined through all cars.

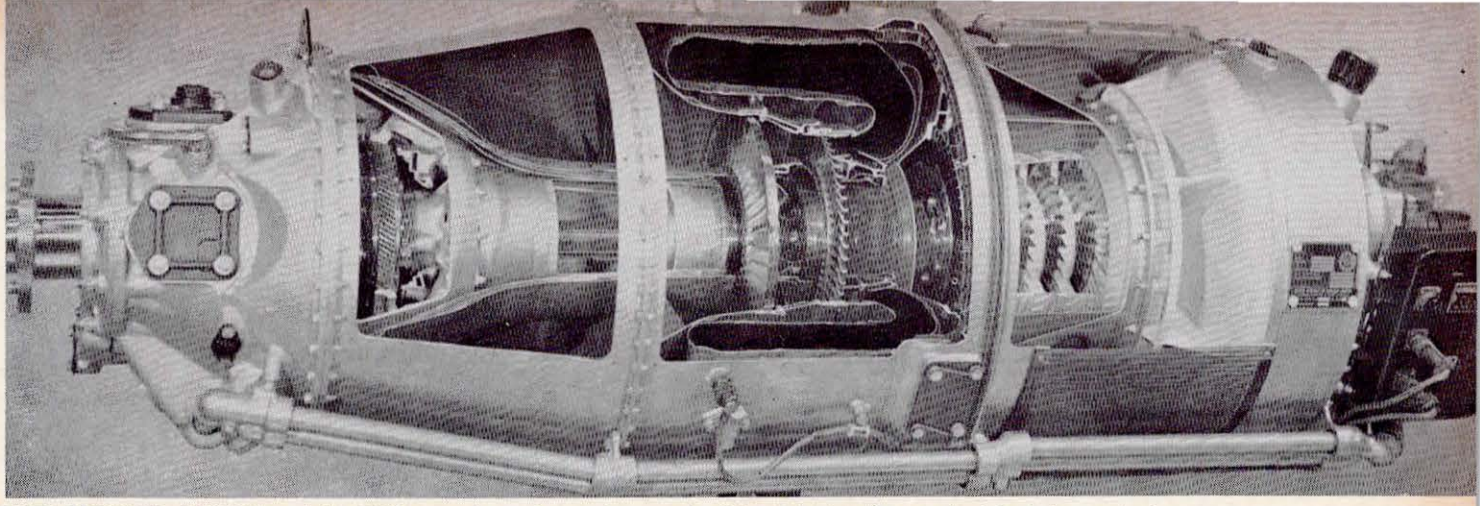
The smaller New Haven trains have three traction turbines, one for auxiliary power, and a d-c traction motor which will be used when the train is in third-rail territory.

● **The curve problem.** Riding comfort has long been a limiting factor on passenger-train speeds, especially when curves are involved. While it is not planned that TurboTrains will operate significantly faster than the top performance of today's conventional trains, they will be able to negotiate curves appreciably faster.

To increase the superelevation of curves to permit faster passenger speeds could have serious effects on freight-train operation. Conventional car suspensions permit the carbody and passengers to be tipped to the outside of the curve when taken at high speeds. The UA suspension supports the car from well above its center of gravity in the manner of a pendulum and also has separate and optimum springing for lateral and vertical forces.

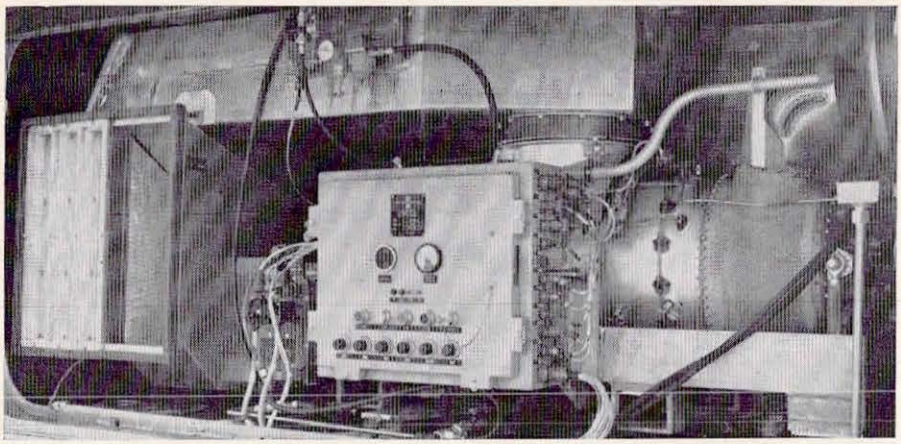
The supporting arms are attached to the bearing housing of the single-axle truck through rubber springs. These arms are mounted at angles which effectively produce a support point near the roof of the car. The carbody rests on air springs on the tops of these arms. When a lateral force is applied to the body, as in a curve at high speed, the arms rotate so the carbody is automatically banked in proportion to the force, maintaining the passenger comfortably upright in his seat. This system, along with the loaded center of gravity only 32 inches above the rail (18 inches lower than conventional equipment), then permits speeds around

*(Continued on page 59)*



**FREE-TURBINE ENGINE** weighs 300 pounds and can be used without hydraulic or electrical transmission.

# Gas turbines give TurboTrains high power ratings



**POWER PLANT,** rated at up to 550 hp, goes in compartment of power dome car complete with controls and air-filter silencer. Exhaust stack goes through dome.

**OPERATOR'S STATION** in front of power dome has single-handle controller.

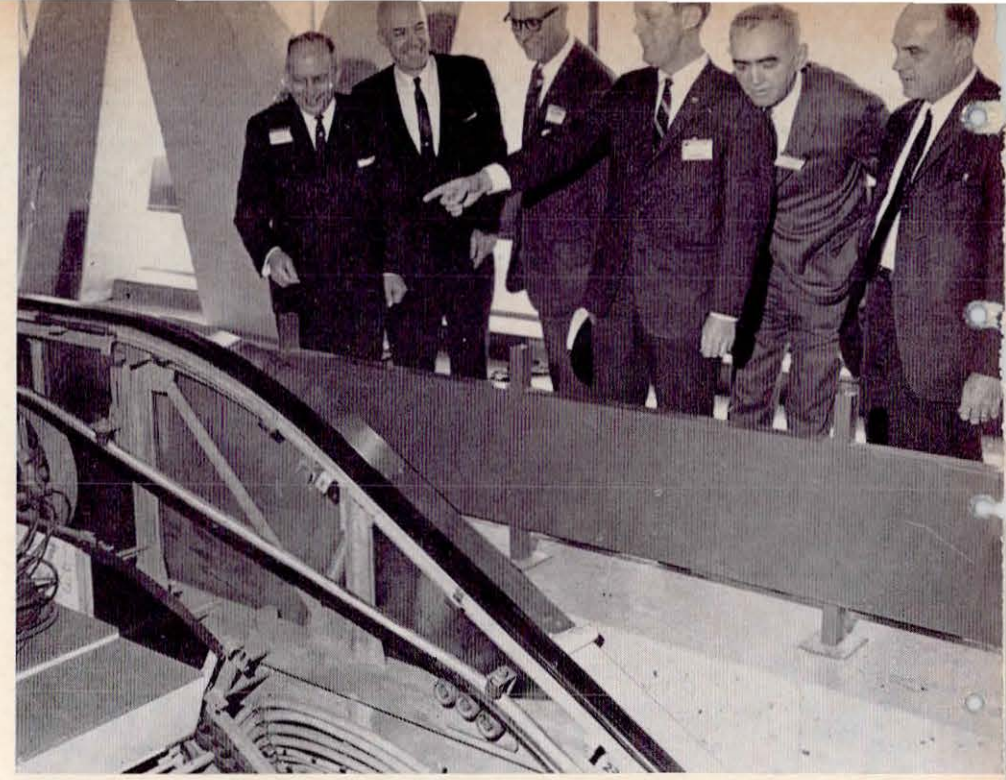
## PARTIAL LIST OF EQUIPMENT USED ON TURBOTRAINS

| | |
|---|---|
| Cab signal equipment | General Railway Signal |
| Interior panels | Arvin Industries |
| | UniRoyal |
| Blowers | Complete-Reading Electric |
| | Lalond Electric* |
| Seats | Globe Wernicke |
| Engineman's seat | Mt. Royal Transportation Equipment |
| Side door, step actuators | Vapor |
| Nose door actuators | Lundy Electronics & Systems |
| Heaters | General Electric |
| Gas turbines | United Aircraft Canada |
| Engine controls | Woodward Governor |
| Auxiliary power generator | General Dynamics/Electro Dynamics |
| Traction motor, controls | Westinghouse Electric |
| Overspeed tachometer | Electro Products Laboratories |
| Overload protection | Cramer/Electronics |
| Regulators | Sangamo |
| Starter generator | Bendix |
| Battery charger | Hartman Electrical Mfg. |
| Fuel-tank cells | Goodyear Tire & Rubber |
| Exhaust system | Allenair |
| | Koppers |
| Safety cutoff | Seeley & Jones |
| Structural, sheet aluminum | Aluminum Co. of America |
| | Aluminium Co. of Canada* |
| Fiberglass body panels | Anawan Plastics |
| | Hemco Corp. |
| | Hill Engineering & Mfg.* |
| Windows | Pittsburgh Plate Glass |
| Wheels | Edgewater Steel |
| | Standard Steel Div., B-L-H |
| Roller bearings | Timken Roller Bearing |
| Air springs | Firestone Industrial Products |
| Air reservoirs | Bendix-Westinghouse |
| | Walton Products |
| Shock absorbers | Houdaille Industries |
| Trucks, mechanical drive | Western Gear |
| Single-axle guidance system | Saginaw Products |
| Dual-axle guidance system | Beaver Precision Products |
| Torsion bars | Kelly Co.* |
| Unit brakes, Anchor shoes | American Steel Foundries |
| | Griffin Wheel |
| | Griffin Steel Foundry* |
| Magnetic brakes | General Electric |
| Disc brake units | B. F. Goodrich |
| | Heroux Machine Parts |
| Air-brake systems | Westinghouse Brake & Signal |
| Draft gear, yoke | Waugh Equipment |
| Automatic couplers | Westinghouse Air Brake |

*CN only.

## CONSTRUCTION in Paris

John Dietz, president of Gannett, Fleming, Corddry & Carpenter (2d from r.) gets details on gallery construction techniques for deep-level, high-speed Regional Express. Conferring with him are (l. to r.) Swindell-Dressler's H. N. Lucas, Barnett Kadin, M. Linon (RATP official), GFC&C's James Herendeen. Metro engineers guided the group through tunnels far below Paris.



## STATION DESIGN in Rotterdam

A new bi-level terminal may provide Washington area officials with ideas for their coming system. Inspecting station are (l. to r.) NVTC Chairman Lee Rhoads, WMATA General Manager Jackson Graham, NCTA Deputy Administrator Warren Quenstedt, WSTC Chairman Carlton Sickles, WSTC Vice-Chairman J. P. Gleason, De Leuw, Cather Vice President J. A. Caywood. Policy-makers learned European fiscal and administrative policies firsthand.

## CARSHOPS in Leningrad

Senior Engineer Vsokhov (center, back to camera) supplied full details on Leningrad cars, trucks, and shop practices to Intourist interpreter, who transmitted them in turn to (l. to r.) S-D's Lucas, Rose City Transit's Charles Bowen, Parsons Brinckerhoff's John Everson, while another Russian engineer looks on.

## ALUMINUM CARS in Berlin

New lightweight cars ride smoothly, stop on a pfennig with automatic train control. Motorman monitors the controls while demonstration is watched by (l. to r.) WABCO's Paul Graham, U.S. Steel's R. B. Cutshall, WABCO's Gene Schaefer, Bechtel's George Thon, General Railway Signal's A. G. Maier.

# European transit tour: A "teach-in"

by JOE ASHER and EDWARD F. DONLON

When a rapid transit official is caught short by an engineer who says, "That's how they build it in Berlin," or an architect who says, "They're doing it this way in Rotterdam," what does he do? He has two alternatives: (1) Take the man's word for it and pass on to other matters; (2) Check up on the matter himself.

Thirty rapid transit operators, engineering consultants and suppliers chose the latter course and went on a 15-day tour of European transit systems, the second transit tour organized by Railway Age.

The basic idea of the tour was a teach-in: You stand a better chance of learning what a system is all about by strap-hanging in a crowded subway car next to a Russian housewife or a German businessman than by sitting in the general offices all day talking to senior officials.

As a rule, the system general manager or his deputy would greet tour members, introduce his staff, and deliver a short summary of operations, policies and plans.

Group members would then be guided all over the system to see new rolling stock, track installations and signaling, tunnels under construction and car shops. Senior officials and engineers would be on hand to point out equipment particulars.

(The exchanges were lively—in a few cases, local engineers had to defend technical choices against U.S. engineers who had other ideas.)

Was the eyeball-to-eyeball technique effective? According to Jackson Graham, general manager of the Washington Metropolitan Area Transit Authority, "It's been valuable and very instructive. I know I learned a lot."

Added Warren Quenstedt, deputy administrator of the National Capital Transportation Agency: "Now, when a fellow comes to me and says, 'Of course you're aware of all the work that's been done in Europe in this field, aren't you?'—I know how to answer him!"

There were surprises on the trip:

## BARCELONA

### The biggest transit meeting of them all

Impressive opening ceremonies welcomed more than 1,200 delegates from systems all over the world to the 37th Congress of the International Union of Public Transport (UITP) in Barcelona. Between technical sessions, delegates inspected the Metro training school and ATC, went to receptions in 14th Century castles.

## MOSCOW

### Rubbernecking? Da!

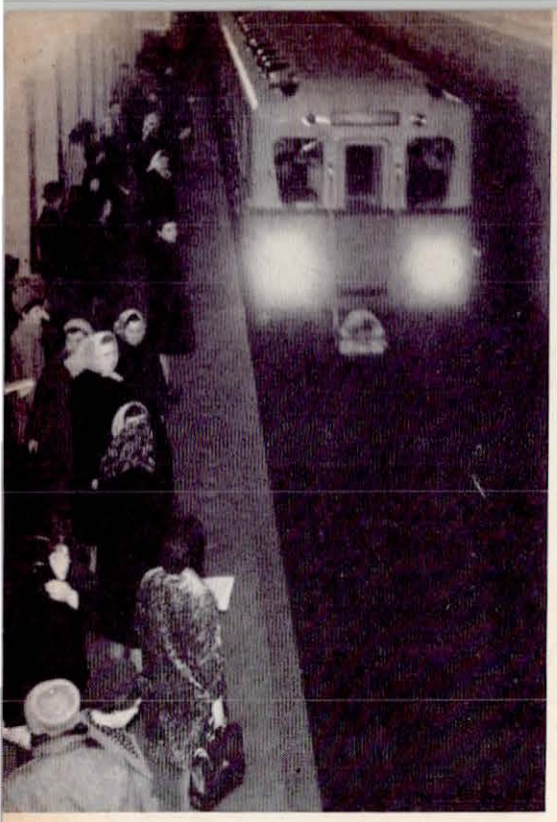
Quick passage through Moscow did not prevent tour members from looking over the system carefully. Cars are much like Leningrad's, although some of the physical plant is older. Much admired were high-speed escalators, spacious galleries in stations. As for architecture in some older stations, many tour members said "Nyet!"

## HAMBURG

### Some like it stainless

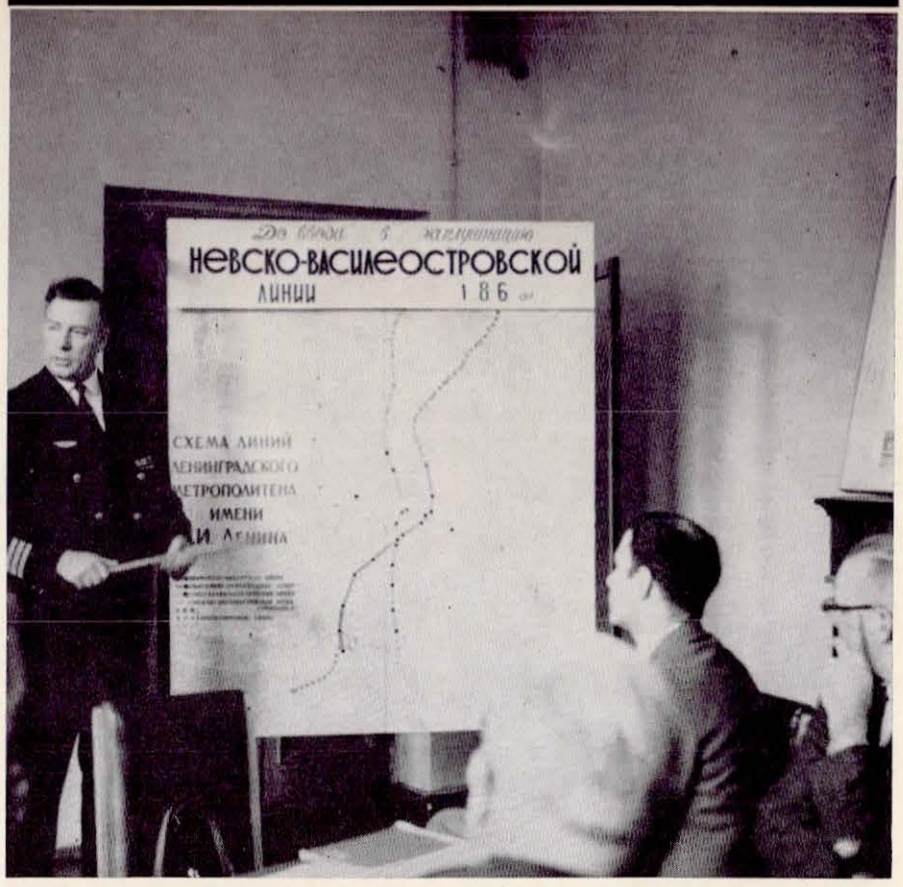
After Berlin officials told why they're ordering aluminum cars exclusively, Hamburg officials gave their reasons for preferring stainless steel cars (below). Trucks are built to design of German Federal Railways. TV cameras monitor station platforms, and Hamburg is leading the way in creating regional transport super-agencies.

# LENINGRAD



## Shoppers' special

Group members were first shown the system by staff engineers, then cut out on their own to ride trains, inspect stations. While not considered models of sophistication, Leningrad's all-steel cars seemed to move large passenger volumes efficiently. The ride was comparatively stable and quiet. As in Moscow, high vaulted galleries are favored for stations. Computer simulation is being used for planning, scheduling.




## You can tell who's the boss

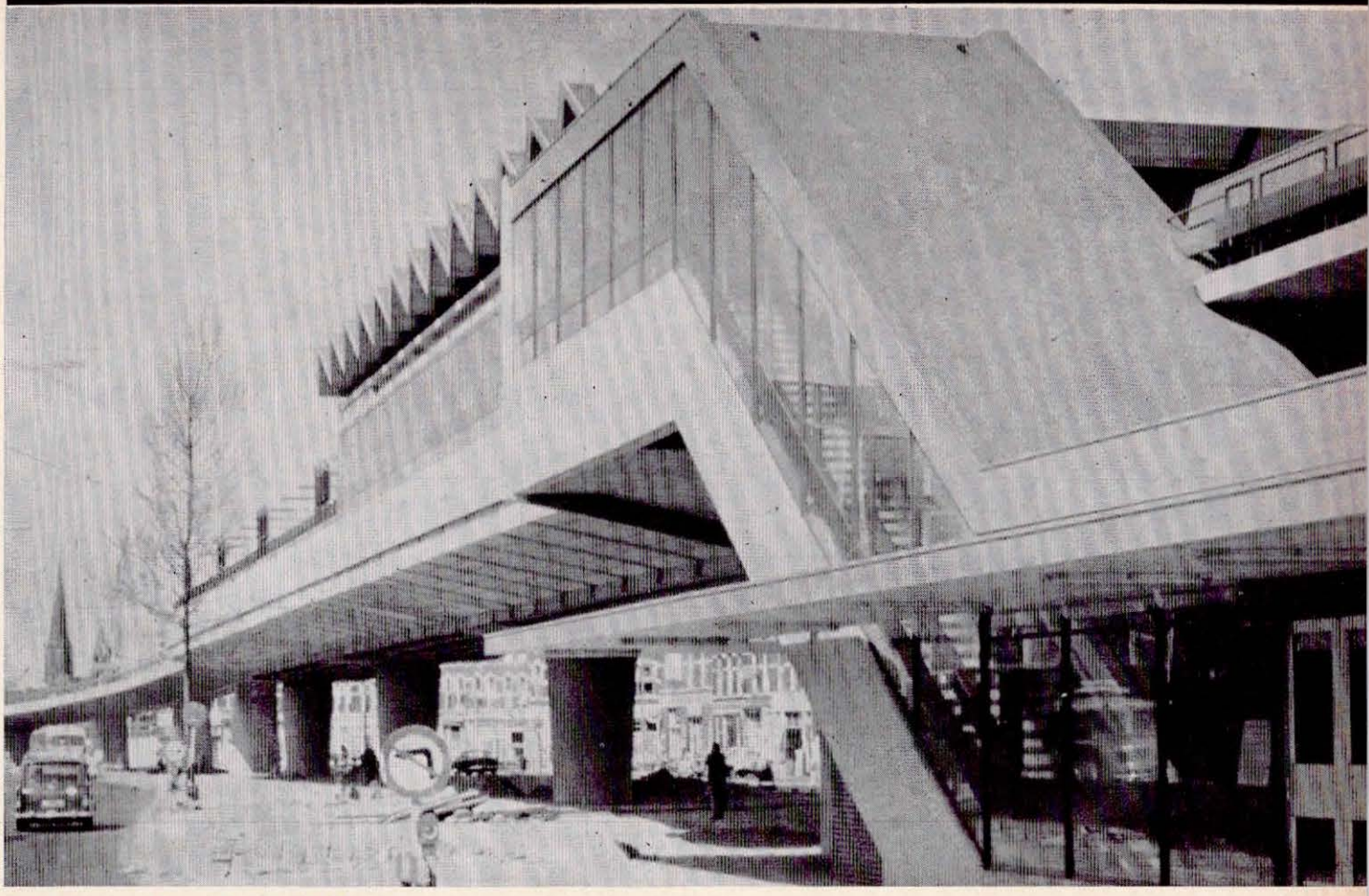
Metro General Manager Vladimir Averkiev wore an imposing uniform to receive the American group. Speaking through an interpreter, he said Russians keep up with developments in the West through technical journals, but emphasized pride in his own system's automatic train control, low fares, construction plans. The system makes a profit—and automatic fare collection will increase it.

## No platform—just a lobby

A famous feature pioneered in Leningrad is the curtain wall in stations: When trains come to a stop, car doors line up with apertures in the lobby walls—cutting noise and improving the view considerably. Stepping from this car is Southern Pacific engineer W. J. Jones. All stations on new Nevsky line will have curtain-wall lobbies.

## Who decides what?

"We do," said Prof. Krivtsov, vice chief of architecture and city planning for Leningrad, when it comes to a land-use master plan. Transport needs for the growing metropolitan area are assessed, then priorities for new Metro, surface lines are assigned. Metro will get many new lines by 1980, as will Moscow, Kiev, Tbilisi, Baku, and Kharkov.



## Aerials aren't ugly in Holland

Metro officials admit some residents were skeptical—but trains are relatively quiet and aerial structures don't deface neighborhoods. This bi-level station has complete traffic separation, with feeder buses coming in on ramps.

Several tour members brought their wives, and one, Mrs. Barnett Kadin —wife of the man who built many of New York's subway tunnels 40 years ago—turned out to be an engineer herself, and accompanied her husband on some inspection trips.

Another lady—Mrs. M. M. McClelland—wife of the president of the Brooklyn Eastern District Terminal Railroad—was formerly a designer, and took a keen interest in station appearance and layout.

For others, the big surprise lay in the warm welcome—cold war or no—from officials of the Leningrad Metro.

Tour members appear to have scored a historic "first" as a result: They were the first professional visitors from the West, so far as is known, to have inspected Russian automatic train control equipment.

Both A. G. Maier, General Railway Signal's manager of mass transit sales, and Paul Graham, manager of mass transit marketing, Union Switch & Signal Division of WABCO, got a chance to climb into the cab of a Leningrad train and inspect the ATC equipment.

*(Continued on page 40)*

## It's a bird, it's a plane . . .

It's an automatic coupler of German design that catches Railway Age Managing Editor Edward F. Donlon's interest at the Rotterdam car shops. In the cab, the Metro's chief signal engineer discusses braking and signaling arrangements with TE's Ritter and WABCO's Schaefer. The new Rotterdam cars are equipped with cab signaling and overspeed control. They're all steel. To cut vandalism, seats are all metal.

## Summit talks

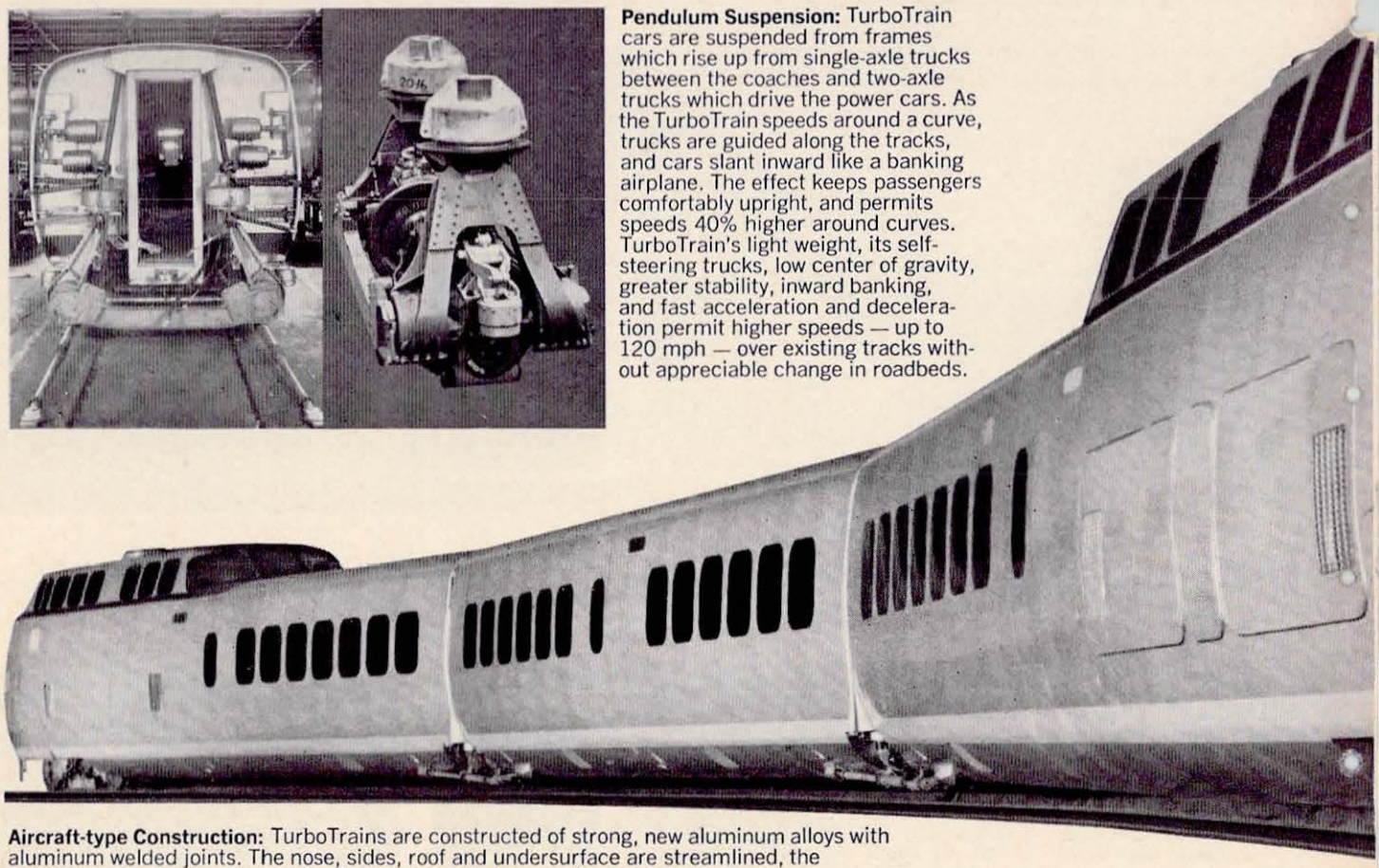
Speaking as a general manager about to put his system into operation to a general manager and commissioner about to embark on construction of one is Rotterdam Metro chief Dr. van Leeuwen (l.); listening are WMATA's Graham and Rhoads, with rail equipment dealer J. E. Simkins in background. What better place to describe the immersed-tube construction method than down inside the tube?

# Aerospace technology starts TurboTrains down the tracks.

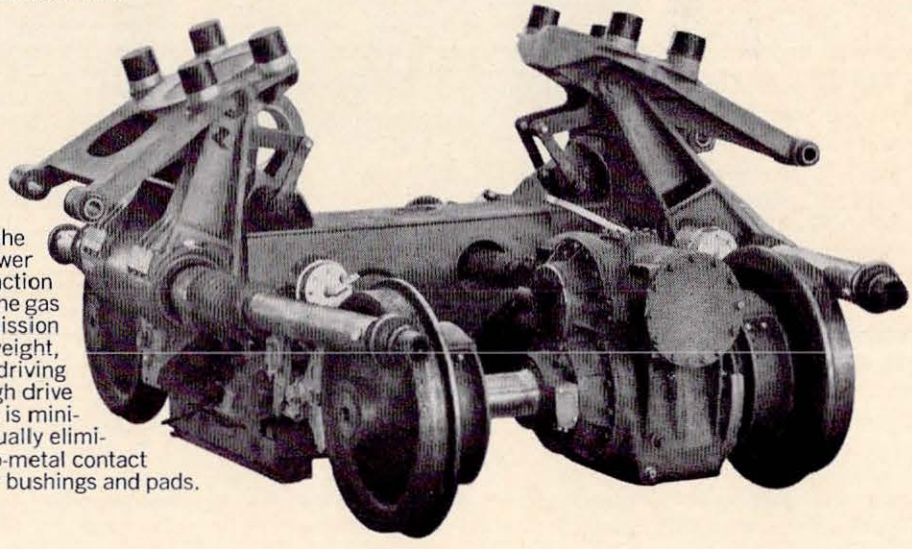
Brand-new TurboTrains designed by United Aircraft will speed rail passengers between Boston and New York and between Montreal and Toronto. Passengers will find both trips quieter, smoother and one hour shorter than before. Railroads will find TurboTrains more economical to operate because of greater utilization, less time lost in switching, and reduced maintenance. The U.S. Department of Transportation and the Canadian National Railways usher in a new era of high-speed, comfortable intercity travel.



**Pendulum Suspension:** TurboTrain cars are suspended from frames which rise up from single-axle trucks between the coaches and two-axle trucks which drive the power cars. As the TurboTrain speeds around a curve, trucks are guided along the tracks, and cars slant inward like a banking airplane. The effect keeps passengers comfortably upright, and permits speeds 40% higher around curves. TurboTrain's light weight, its self-steering trucks, low center of gravity, greater stability, inward banking, and fast acceleration and deceleration permit higher speeds — up to 120 mph — over existing tracks without appreciable change in roadbeds.

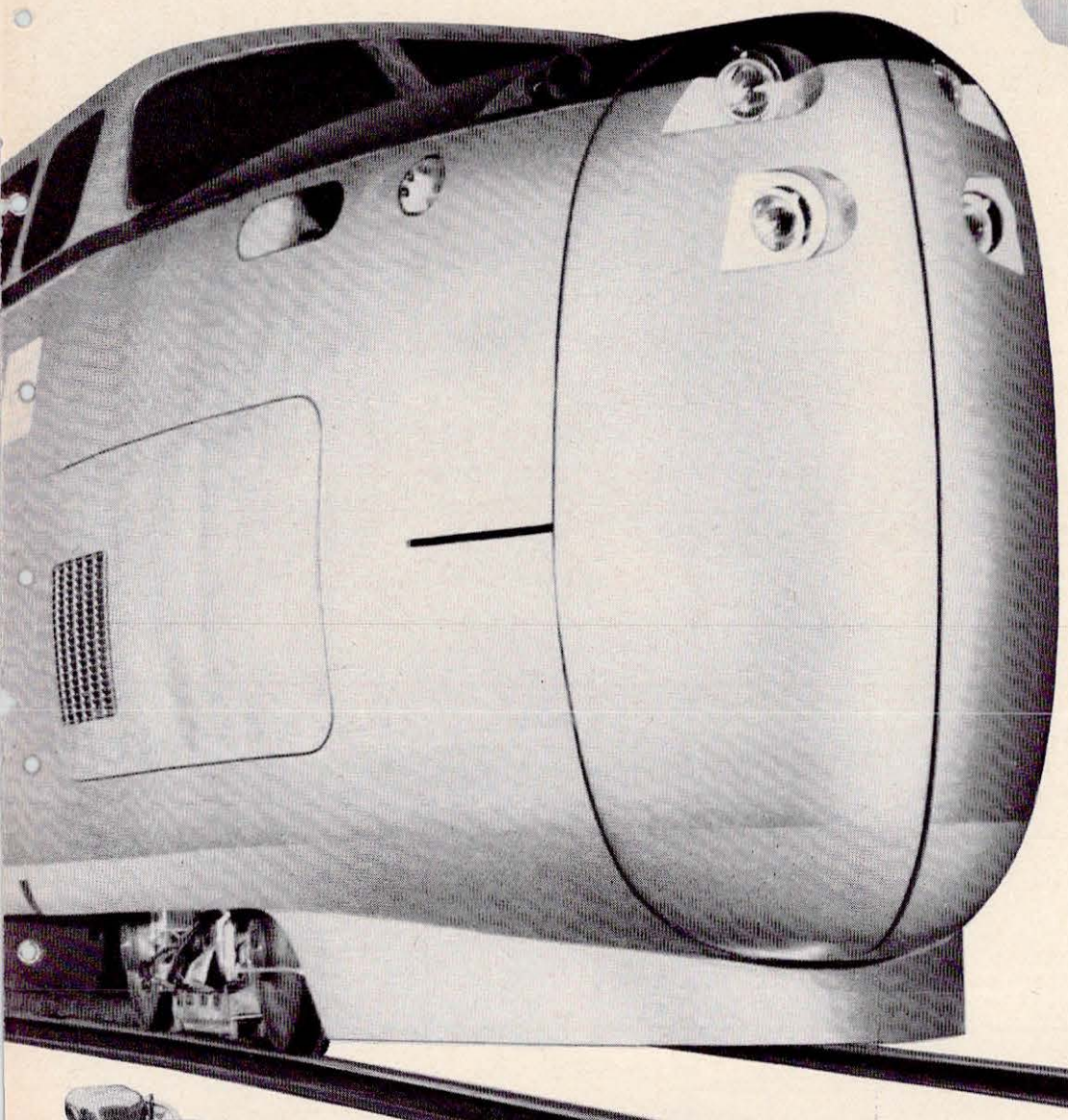


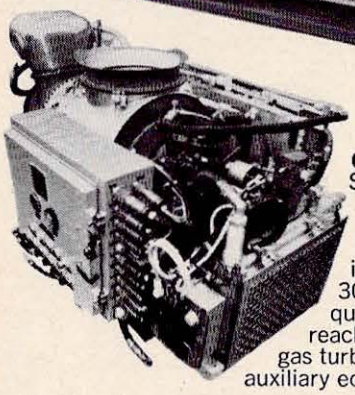
**Aircraft-type Construction:** TurboTrains are constructed of strong, new aluminum alloys with aluminum welded joints. The nose, sides, roof and undersurface are streamlined, the aluminum skin is smooth, and the tinted glass windows are flush. TurboTrains weigh less than half as much as comparable diesel trains, and require less body maintenance.



**Power Trucks:** At the forward end of each power dome car is a two-axle traction truck linked directly to the gas turbines. The transmission is a simple, lightweight, geared arrangement driving each axle through drive shafts. Noise is minimized by virtually eliminating all metal-to-metal contact with rubber bushings and pads.

**Passenger Comfort:** Much like jet airliners, TurboTrains will have individual, wide reclining seats, carpeting and draperies, air-conditioning, soft indirect lighting, and individual reading lights. Slight pressurization will keep out dirt, noise, heat and cold. Club car passengers will be served refreshments and meals at their seats.





**Gas Turbine Engines:** ST6 gas turbines will drive each train. These engines are derived from Pratt & Whitney Aircraft's PT6, a design proved in aircraft, helicopters, marine and industrial applications. Each engine weighs 300 pounds, delivers up to 550 hp, starts quickly even at 60 degrees below zero, and reaches full power in half a minute. Another gas turbine provides electrical power for auxiliary equipment.

United Aircraft Corporate Systems Center

FARMINGTON, CONNECTICUT

DIVISION OF UNITED AIRCRAFT CORPORATION

U A

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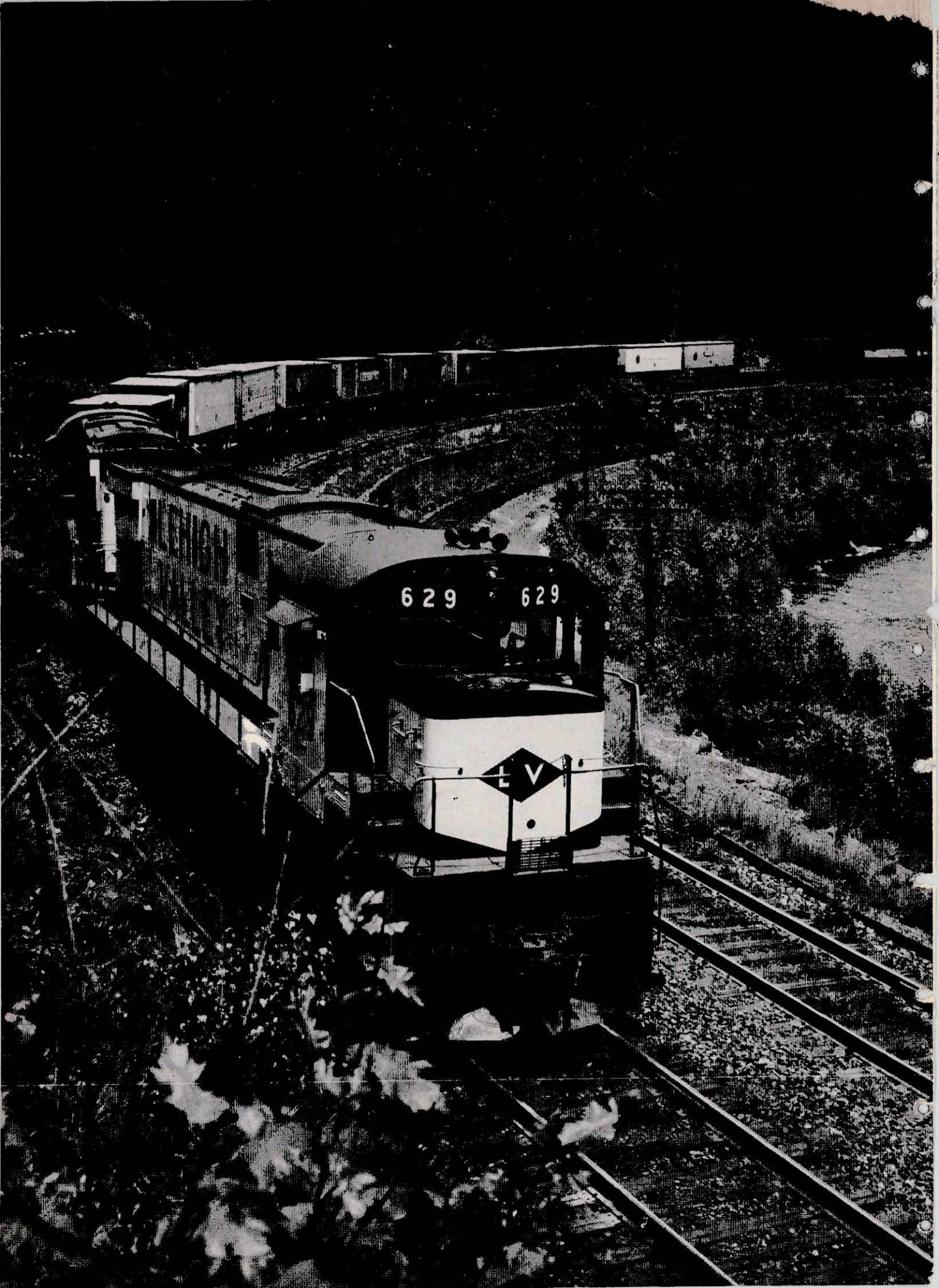
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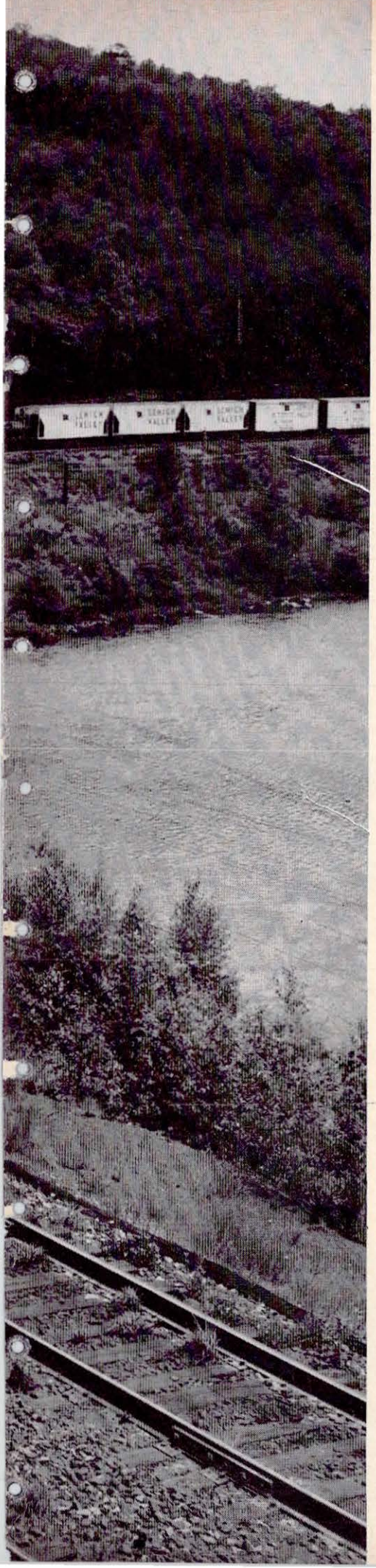

# Buffalo Gateway to New York Gateway in 12 hours.

# That's the kind of service the Lehigh Valley demands 7 times a week from their Century 628's.

You have to move fast. Very fast. When you're hauling piggy-back and other high-class freight.

And because ALCO Century 628's really know how to get up and move, the Lehigh Valley drives them hard. Over mountains. Through valleys. From Buffalo to metropolitan New York and back. Day after day.

"We believe in giving our customers high-speed service," says John F. Nash, President and General Manager of the Lehigh Valley Railroad. "To do it, our motive power must have stamina. And versatility, too. Because we also move a lot of heavy-tonnage freight with the same locomotives."

Endurance. Versatility. The Lehigh Valley demands and gets both from their Century 628's.

And with good reason. ALCO's proved and improved Model 251 diesel engine delivers 2750 hp for traction. Dependable power that helps make Century 628's adaptable to all classes of railroads. Railroads like yours, for example.

But don't take our word for it. Ask John Nash or any railroader who's in the know on Century motive power. Then contact us for complete data on the full line of Century locomotives. ALCO—only domestic manufacturer offering a choice of three power transmission systems: AC, DC, and Diesel-Hydraulic.

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ALCO

Along the Lehigh River, a consist of ALCO Century 628's speeds a high-class symbol train toward the Lehigh Valley's Jersey City terminal that serves the metropolitan New York Gateway.

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# How the Chicago Transit Authority gets the signal with Anaconda data logging cable

The Chicago Transit Authority is on its way to automated control of trains. A special Anaconda cable is helping it test its way on CTA's Lake Street Elevated Line.

Here, a specially designed Anaconda data logging cable parallels the track. It carries the signal that activates a unique speedometer with color signals in the cab of the train. The speedometer indicates maximum permissible speed along the system. If the motorman doesn't respond to the maximum speed within 2.5 seconds, the train automatically stops. That's a safe way to run a transit system.

The special figure-8 sheath-messenger Anaconda cable required a special design: a polyethylene sheath forms an integral cover for the messenger and cable core assembly and also composes the web. The polyethylene-PVC insulated conductors of the cable core are twisted into pairs. Each pair is covered with a mylar tape and the entire cable core assembly is covered with a similar material. The result is data logging cable that withstands vibration, possesses high corrosion resistance, has lower stress concentrations and does the good, safe electrical job for which it was designed.

Anaconda can help you with your data logging cable requirements. Call the Man from Anaconda and find out. Anaconda Wire and Cable Company, 605 Third Avenue, New York, N. Y. 10016. 67238

ASK THE MAN FROM
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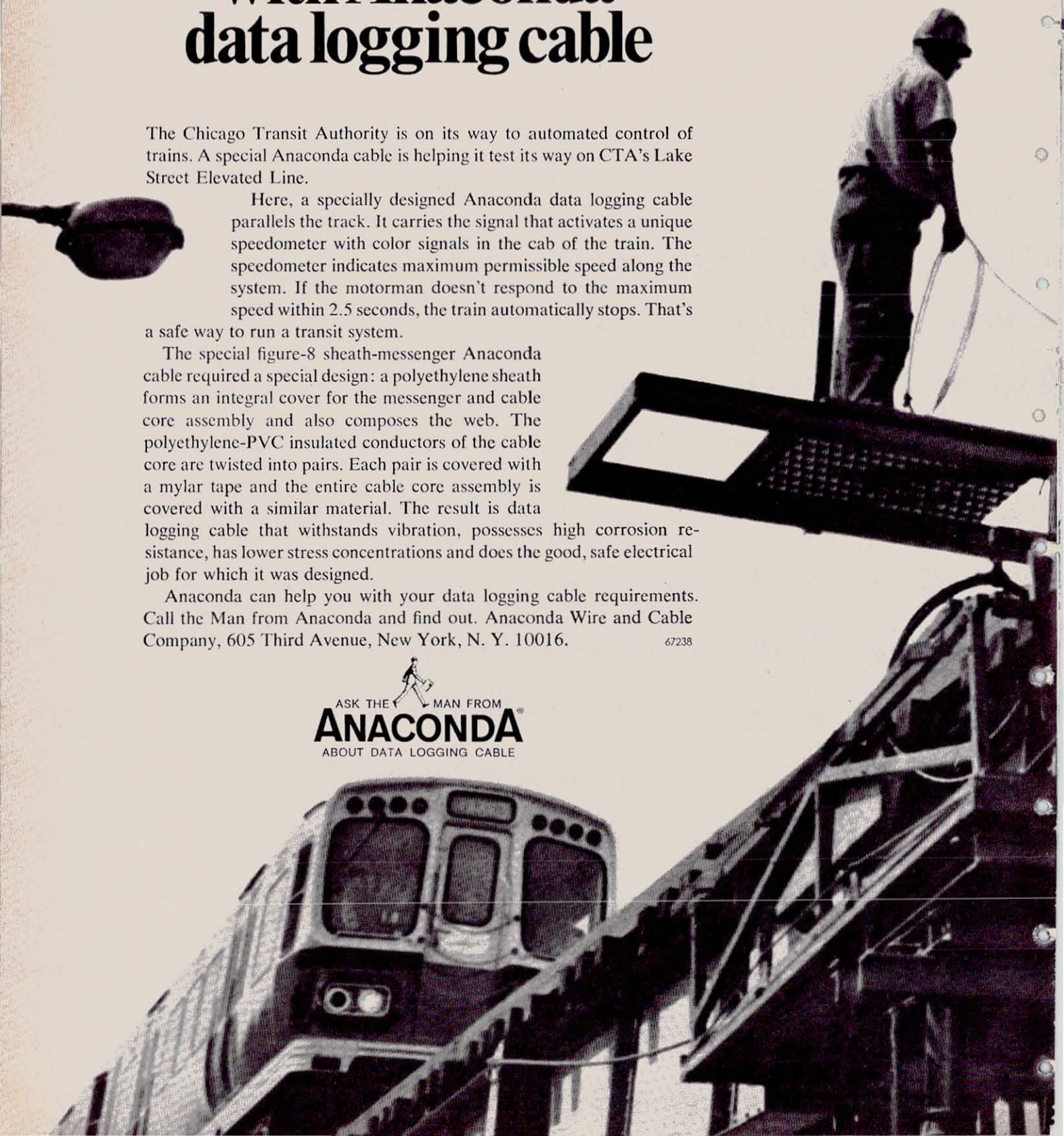
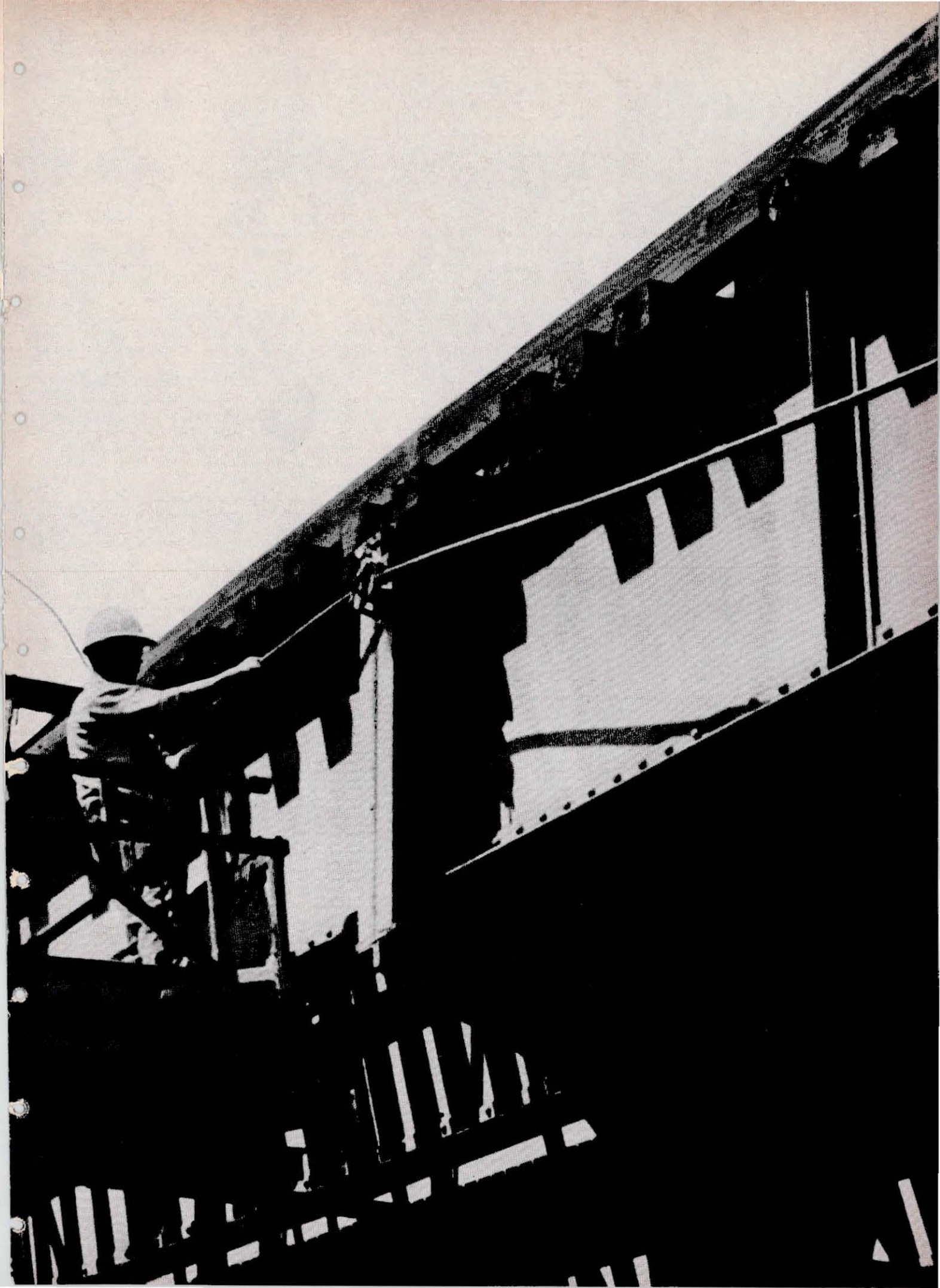




# PARIS

## The show is run from here

From this CTC master console, Metro signal engineers can program all operations on Line 1, view progress of trains on panel in background, override schedules in emergencies. Ranged round the console (l. to r.) are WSTC's Sickles, DMJM's Mendenhall, International Railway Journal European Editor Geoffrey Wilson, RA Transit Editor Joe Asher, U.S. Steel's Cutshall, NCTA's Quenstedt.

*(Continued from page 33)*

Commented Graham afterward: "This is known technology, it doesn't represent any breakthrough—but it sure is something to actually go and see it."

Leningrad courtesy extended to other matters, as well. Uniforms are the thing in Russia's second city, and Metro General Manager Vladimir Averkiev greeted the Railway Age group along with his staff, in full regalia, to deliver a talk on construction plans, traffic volumes and fiscal policies.

The system presently has 16 route miles and 18 stations, with a three-mile segment of additional line coming into operation next November.

Some more miles of line are under construction, to be in service by 1970, and the system should reach a total of 72 route miles by 1980.

● **Likes, dislikes.** Some engineers—James Caywood, vice president, De Leuw, Cather, and H. N. Lucas, project manager, Swindell-Dressler—were less than impressed by concrete lining techniques in the Leningrad tunnels, but most tour members were enthusiastic over the stations — spacious and equipped with high-speed escalators to handle the heaviest traffic flows smoothly.

John Detlie, project architect for Kaiser Engineers-DMJM — carried a decibel meter with him to test sound volumes of all systems, and found Leningrad's latest cars somewhat quieter than Moscow's.

Construction methods in Rotterdam got thumbs-up from quite a few U.S. engineers, with especially favorable comments from I. F. Mendenhall, president of Daniel, Mann, Johnson & Mendenhall, and V. E. Cole, vice president, Kaiser Engineers. De Leuw, Cather's Caywood went so far as to say he was considering sending over some of his own staff members to study what Rotterdam is doing.

● **World's newest system.** As Rotterdam Metro General Manager Dr. C. G. van Leeuwen and Deputy General Manager L. Tissot van Patot explained it, the first four-mile segment of the system has been under construction for four years, with service due to begin next February.

An immersed-tube method was employed, whereby sections of pre-cast concrete were cast in trenches along the future right of way, the trenches were allowed to fill with water, and the tube sections were then floated into position.

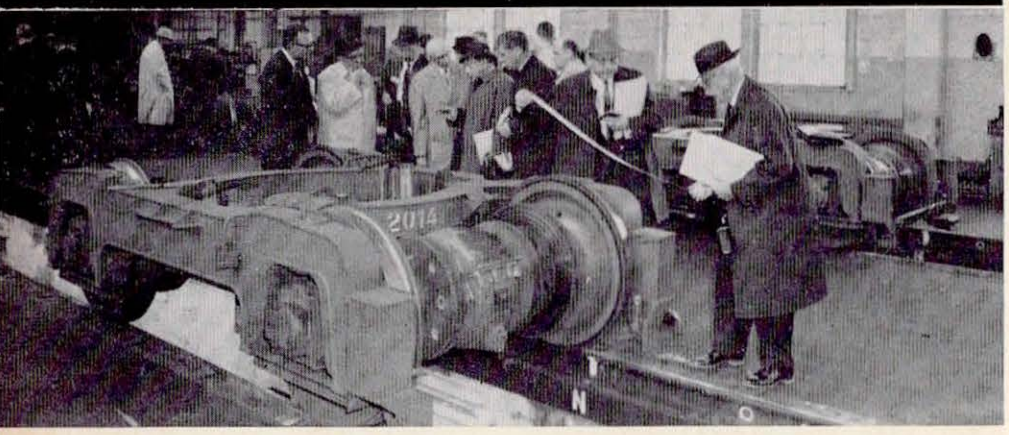
The 27 two-car articulated sets of new all-steel cars were inspected in the shops. Then a ride out over the line to the southern terminal took the visitors to see a bi-level facility for bus feeder service. Apparently much impressed were the policy makers on the trip—Carlton Sickles, chairman of the Washington Suburban Transit Commission and WMATA Commissioner, J. P. Gleason, commissioner of both WSTC and WMATA, and Lee Rhoads, chairman of the Northern Virginia Transportation Commission and also a WMATA commissioner.

For many, the all-round winner on the tour popularity poll was the Berlin BVG (Metro), where new aluminum cars, truck and station design, track maintenance and sophisticated signaling got wide approval from the American visitors.

● **The quietest ride.** Everyone admired the new aluminum cars, which rode smoothly, and which Detlie found to be the quietest of any system tested. How was it done? At the car shops, a car frame was lifted off a set of trucks to show all the rubber springing between axle and sideframe, and between truck and car frame—facts which interested John Everson, partner, Parsons, Brinckerhoff, Quade & Douglas; S. H. Froid, vice president, Tudor En-

*Continued on page 63*

# BERLIN



## There's no magic to it

NVTC's Rhoads and TE's Ritter seem bent on proving the famed Berlin truck design is anything but mysterious. At any rate, they're taking down its dimensions with a tape measure. U.S. visitors were impressed with carshops, especially speed with which trucks could be disengaged from car frames for maintenance.

## It could be the 42nd St. shuttle

. . . but actually, it's the Berlin system, as group members take turns in the cab, watching ATC in action. The new aluminum cars offer an unusually smooth ride, and their light weight means considerable saving in power costs. BVG chief Struwe rapped on car interior walls, asked what material it was. Laminated plastic, U.S. visitors thought. "No," said Struwe. "It is fireproof plywood." Exteriors are painted.

# Boston transit to get new signaling

**Two MBTA lines will be able to run with 90-second headway.**

**CAB SIGNALING** and automatic car identification equipment will help speed operations on the MBTA's Cambridge-Dorchester line and the new South Shore line.

With the installation of pre-programmed train dispatching, new train control and cab signal equipment, trains will operate on two lines of the Massachusetts Bay Transportation Authority with only 90-second separation. Eight-car train groups will operate on the new South Shore line at speeds up to 75 mph. On the Cambridge-Dorchester line, 6-car train groups will operate up to 50 mph.

The $5,613,000 contract, awarded to General Railway Signal Co., for installation of the signal equipment also provides for high frequency electronic track circuits, safety interlocking of switches and signals, supervisory control consoles and status displays, a high-speed solid state electronic data transmission system, a telephone system, and a Sylvania KarTrak car identity system.

A control console with a track layout diagram of the entire South Shore line and Cambridge-Dorchester line, and a dispatcher's console—with two headway recorders and dispatching equipment—will be at the Washington Station.

- **Automatic dispatching.** Five pre-programmed dispatcher units are to be installed in the central office. Dispatching commands will be transmitted, via a GRS System 4000 supervisory control system, to control signals and provide control of interlockings according to four schedule patterns. A train may also be dropped from or added to the schedule.

Facilities will be provided for manual local dispatching, or via supervisory control from either the control console or dispatcher's console.

- **Vital information to trains.** Operation of trains in either direction, will be permitted by the cab signal system. Coded information, continuously transmitted through the rails, from wayside to train, will show block conditions ahead. Receiver coils at each end of a car set will couple carrier energy from the rails to onboard equipment. On the train this information—coded carrier energy—produces speed commands which are displayed and compared with actual train speed to regulate maximum speed. The motorman is informed of the maximum allowable speed, speed limits are enforced, and train speed is maintained just below the maximum allowable rate.

- **Automatic speed control.** A speed regulation system will provide inputs to the traction and braking system for smooth acceleration and deceleration and to maintain speed within ± 2 mph of the maximum allowable.

When a speed change is called for by the cab signal system or by the motorman, speed regulation and overspeed systems act together to initiate an immediate change.

For a speed increase, the system causes the train to accelerate at a comfortable rate to a higher speed level and then automatically maintains that speed. The rate of acceleration and the rate of change of acceleration are monitored and controlled by a computer. When the requested speed is reached, the system modulates the power and controls the brakes to maintain this speed.

For a decrease in speed, service brakes are applied. Brake response is monitored by the computer to ensure safety and smooth operation—brakes are released under computer control to "flair out" into the required speed without excessive undershoot.

Train speed is compared, in the overspeed system, with the maximum allowable speed. If speed is below the maximum, no action is taken. If speed exceeds the allowable rate, the motorman is warned that a brake application is required. If no action is taken, brakes will automatically be applied to stop the train.

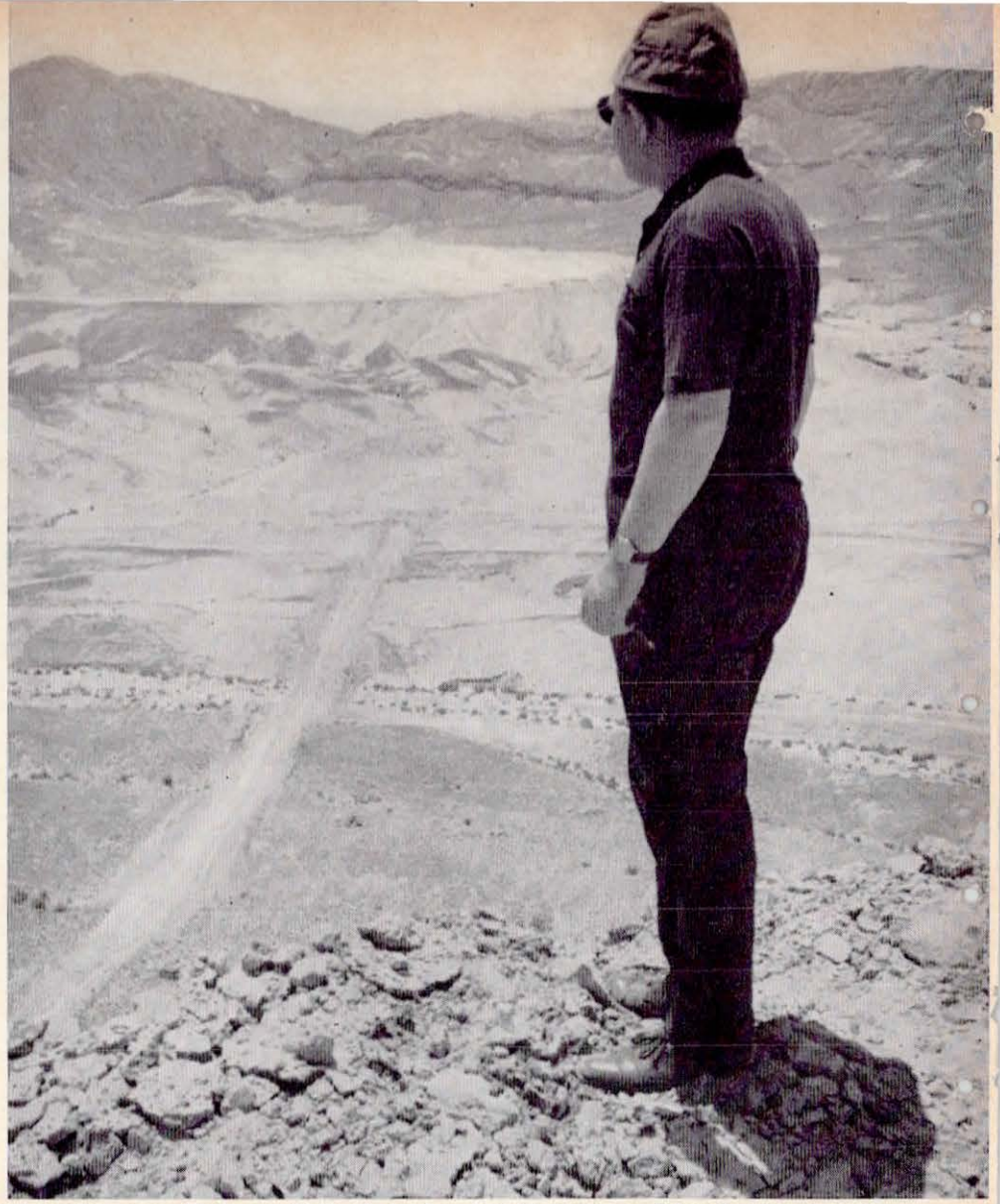
- **Fail safe.** The train control and cab signal system will be self checking for fail-safe operation. Safety is ensured by constant surveillance of the motorman's response to wayside conditions. He is penalized—with an automatic brake application — should he ignore a more restrictive signal aspect, or operate overspeed.

Cab equipment includes a speedometer, indicator lights to read out the various commands, and illuminated displays to indicate speed limits of 75, 65, 50, 40, and 25 mph, stop, cab signal cutout, and emergency control.

- **Car identification.** As part of the over-all project, Sylvania Electric Products' KarTrak automatic car identification system will be installed. Colored labels representing car numbers will be applied to MBTA cars. Wayside scanners at strategic points will identify passing cars. For example, a scanner will be in approach to the interlocking at the junction south of Andrew. As a train passes the scanner, car numbers will be read and the information passed on to interlocking equipment which will then automatically align switches and clear signals for the proper route for the train.

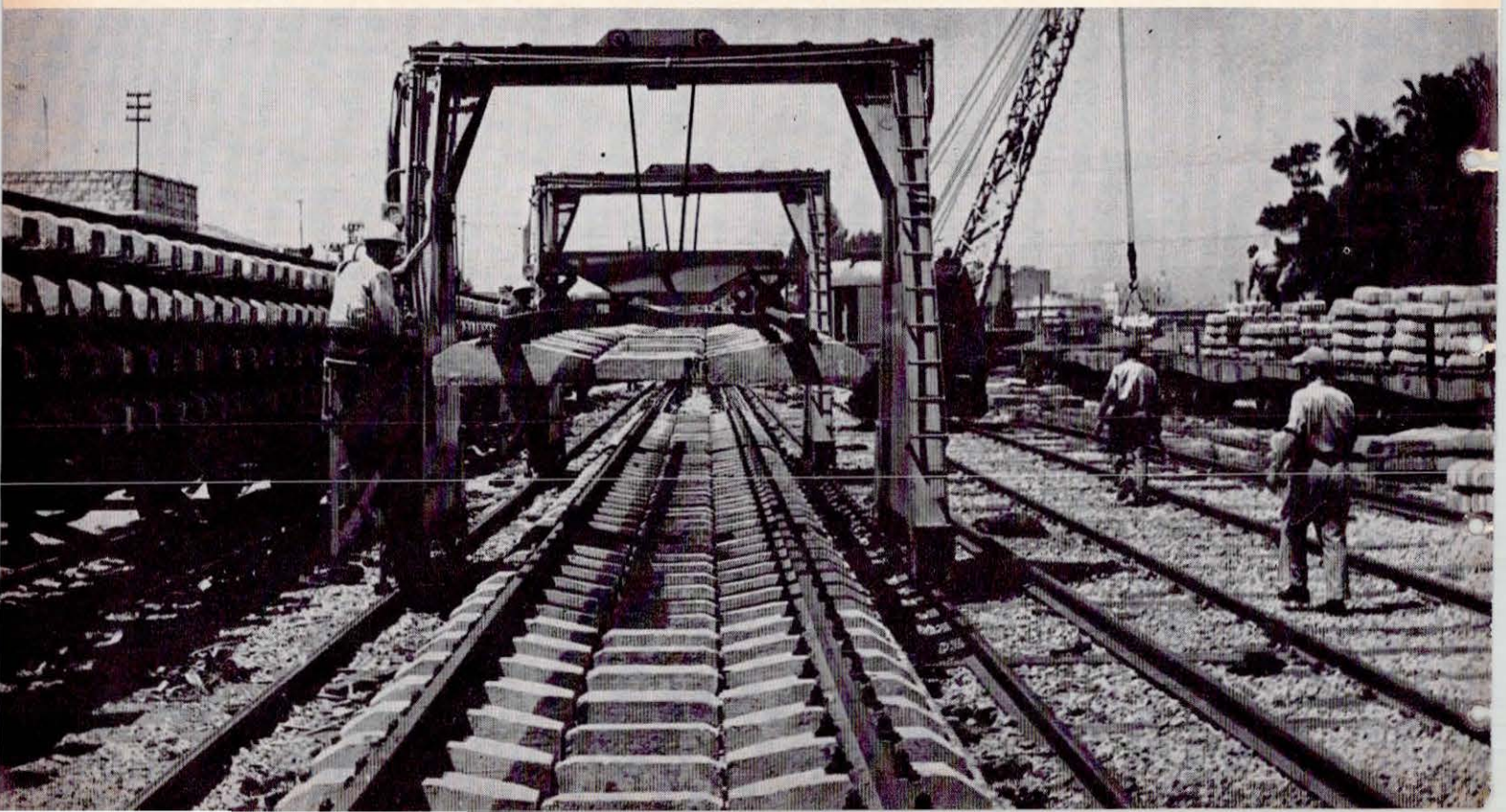
Scanners will also be at the terminal at Harvard Square, Ashmont and Weymouth. These scanners will read car numbers for identifying trains entering and leaving terminals. This car identification data will be transmitted to a central location for use in scheduling. Such car-in data will be helpful also in developing car mileage statistics useful for car maintenance procedures.

The project is scheduled for completion during 1968. ■



**VITAL RAIL LINE** through the desert (map) would serve Elath on Gulf of Aqaba. Israeli engineer (above) surveys route.

**TRACK ASSEMBLY PLANT** at Haifa produces 59-foot panels with concrete crossties for Israel Railways.



# Israel plans a rail "canal" to disputed Gulf of Aqaba

**A strategic 80-mile railroad line across the desert to the Port of Elath is being proposed to give Israel a new route to the East. Observers believe recent war gains will prompt construction.**

*Railway Age International Editor John Levett was in Israel on assignment shortly before the outbreak of hostilities in the Middle East. In interviews with Israel Railways officers he discussed IR's plans to build an important rail line to the port of Elath on the Gulf of Aqaba.*

*In this dispatch from London, Levett reports on his talks with the Israelis and the possible effect their recent military successes may have on construction of the vital rail line.*

By JOHN LEVETT

If Israel's access to the Red Sea through the Straits of Tiran is guaranteed as a result of the recent Israeli military victory there seems no doubt that every effort will be made to speed construction of the railroad to the port of Elath.

Abraham Zwick, General Manager of Israel Railways (IR), told me in Haifa three weeks before the fighting began: "This line could be our Suez Canal. It will give us a direct route to the East."

Israeli leaders have emphasized the importance of the port of Elath to the tiny nation's economy and are determined to keep the Gulf of Aqaba open to Israeli shipping. The port is expected to grow rapidly as a major maritime facility, requiring service by a rail line to link it with other areas of the nation.

Until now the Israeli Government has not been giving priority to the line in its annual budget. And it will be a costly line for a small state like Israel —though exactly how costly no one will know until a work study is complete.

"Our 'guesstimate' is that this 80-mile track through the desert will cost us about $40,000,000—railroad construction is excessively costly these days. It's my job to convince the government that it would be an economic proposition," Zwick adds.

Economic justification for the extension should not be difficult to find, quite apart from the obvious strategic importance of such a line.

● **Rich mineral lands.** Though most of the country's mineral exports (there are huge phosphate and potash deposits now being worked in the south) will go through the new port of Ashdod, exports to the east would find a cheaper and quicker route through Elath.

Construction is already in progress from Dimona to the Oron phosphate deposits, in the Negev. Potash loading facilities are being transferred from Beersheeba to Dimona, and phosphate facilities will be transferred to Oron as soon as the line reaches there.

On the coastal line between Haifa and Tel Aviv, source of most of IR's passenger revenue, the track is being gradually reconstructed, using concrete crossties and 100-pound U36 rails from France.

Main difficulty in carrying out this work is that the line is single track—and the only time the line isn't operating for more than a few hours is on the Jewish Sabbath, when all traffic stops. But putting men to work on track reconstruction on the Sabbath brings adverse criticism from the influential orthodox community.

Chief engineer A. Golan told me: "If we can get the line clear for 12 hours we can lay a kilometer of track including dismantling, levelling, laying and ballasting. But we don't often get as long as that in one stretch."

After studying techniques in several west European countries, Golan decided to adopt the method used by British Railways' western region. Two Geissmar portal cranes were ordered and a panel assembly base was built at Haifa.

Panels are assembled to a length of 18 meters (59 feet) and hauled to the site on a low loader once a week. Rails are welded to 200-meter lengths and eventually will be welded from station to station. Golan told me: "Climatic conditions for long-welding are more favorable here than in some parts of the world.

"In the north temperatures range from 0 to 60° C, and neutral temperature is 22° C. Distress and fastening takes place at about 38° C. Next year we plan to use rail warmers in winter."

**MACHINEGUN-TOTING** Israeli soldier probes line with mine detector.

About 40 laborers are used on the job, with up to 60 on concentration days. Equipment used includes a Matisa BN-60 tamper-leveller, a Kershaw disperser and several Robel screwdrivers.

Reconstruction of the line should be completed by early 1969, "so long as the government coughs up the money," said Golan.

● **Healthier traffic position.** Though IR shows a regular deficit, the traffic position should be much healthier as a result of a mineral contract just signed. This will give IR 1,100,000 tons more traffic each year on the line from Dimona to Ashdod.

New storage sheds built at Ashdod will take 45,000 tons of potash or phosphate each, a big advance on the limited storage facilities at Haifa. Dis-

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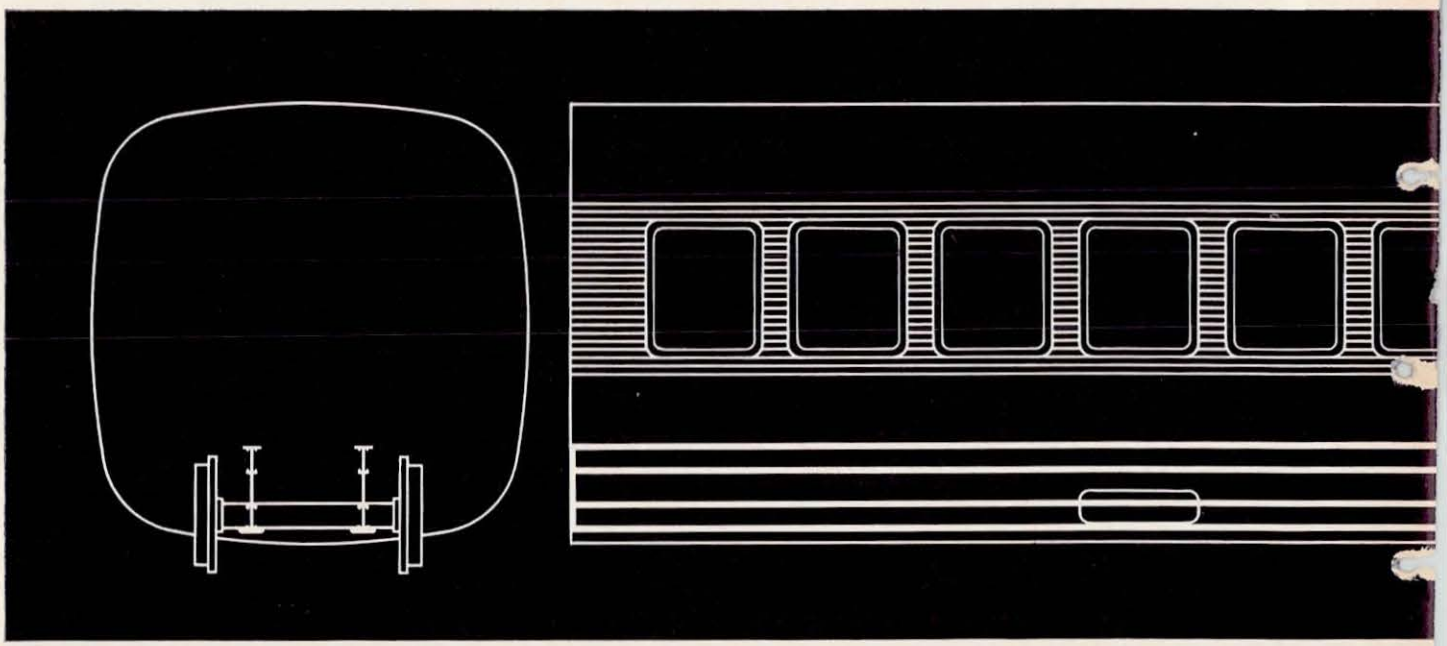

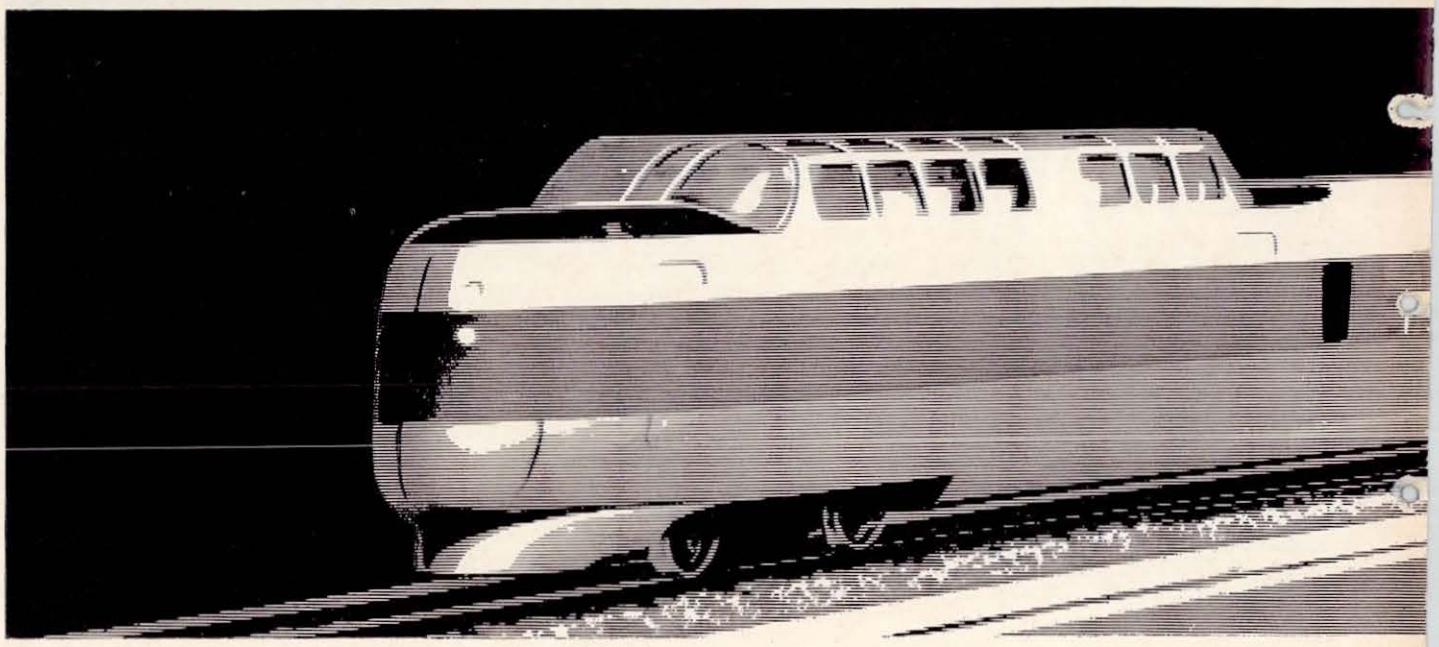

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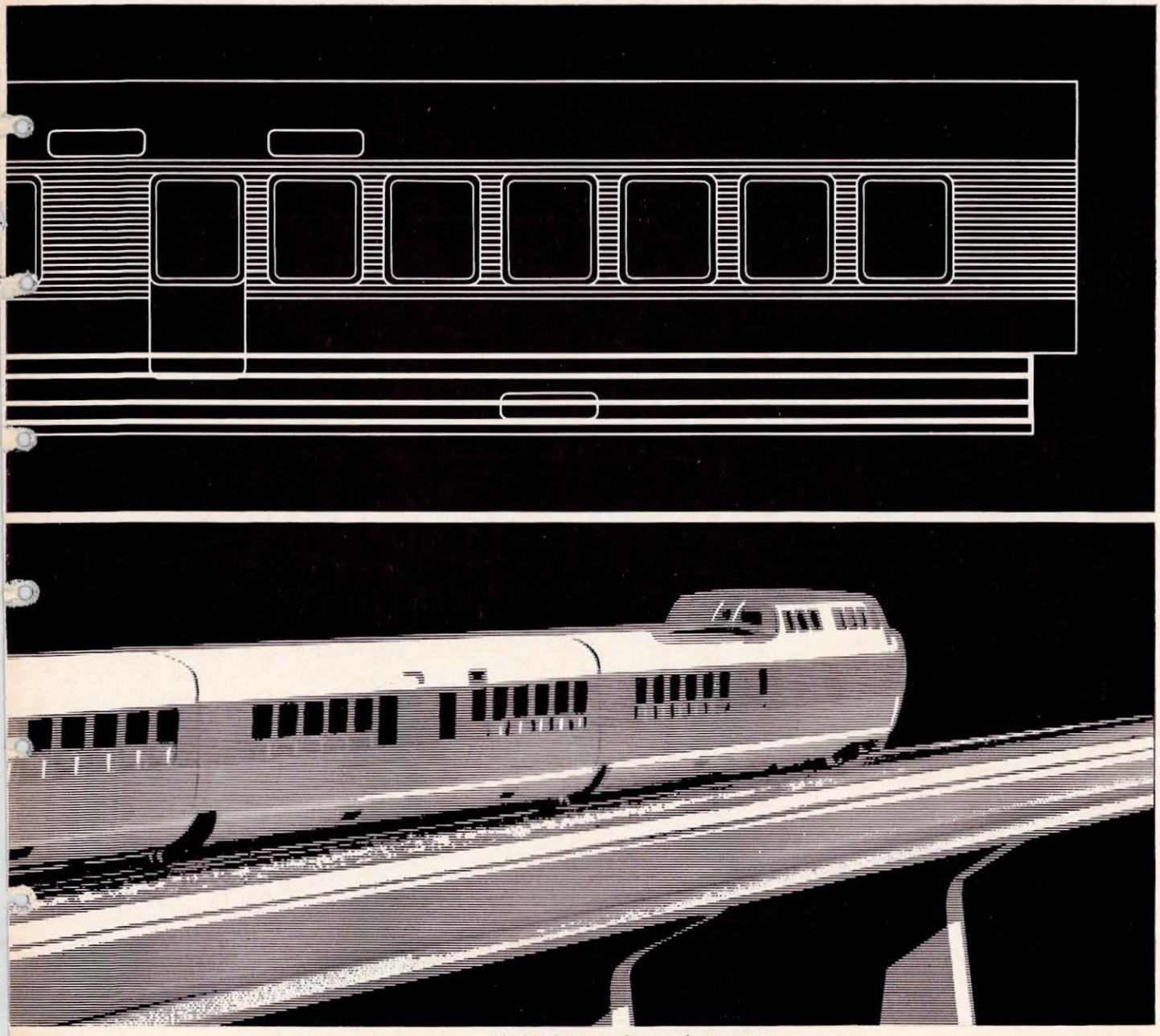

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LUTHER MILLER

# AS THE EDITOR SEES IT...

**A NIGHT TO REMEMBER**—"What were you doing when . . .?" The question is usually asked in relation to Pearl Harbor or some other internationally cataclysmic event. Well, I for one will not soon forget what I was doing at eleven minutes past nine last Tuesday night. I was sitting in my living room worrying about what President Johnson was doing. The bill restoring the 7% investment tax credit was on his desk. He had until midnight to sign it, veto it, or let it become law without doing anything. Shortly before 9:30 my phone rang. It was Nils Lennartson, president of the Railway Progress Institute, calling from Washington.

"He signed it," said Nils. "At 9:11." I could almost hear Nils grinning over the telephone.

This event earned only five short paragraphs on (for some curious reason) the obituary page of the next day's New York Times. But for railroads, and for railroad suppliers, it was little short of historic. The dam was broken; the flow of car and locomotive orders that would help keep our great industry rolling had been released.

The events that brought the railroad supply industry to a state of near paralysis began in Washington last autumn. It took eight months to undo the damage.

If there was one lesson that railroad men could learn from the siege it was this: Whenever Washington and politics enter the picture, patience beats panic any day of the week.

**THE LONG, DRY SPELL**—Congress suspended the investment tax credit on Oct. 11, 1966. This would not have been so bad if Congress, at the same time, had not promised to restore the credit on or about Jan. 1, 1968. This amounted to an invitation to cease all activity in the market for better than a year.

That invitation was gradually, if grudgingly, accepted by railroad men —who are, after all, business men, and do not lightly buy today what can be had for a greatly reduced price tomorrow.

In the first four months of this year, only 12,231 new freight cars were ordered. This was fewer than the number of cars ordered in a single month during the same period a year ago.

On March 9, President Johnson, prodded by the business community in general, and railroad men in particular, asked Congress to restore the investment incentive. The House moved swiftly to do so. In the Senate the bill got all snarled up with a campaign contributions rider, and during the ensuing 50-odd days we witnessed the dismal spectacle of the tail nearly wagging the dog to death. But Congress did finally act, and the bill made its way to the White House. And there it languished.

Presumably, the President was weighing the political consequences of giving business what would widely be viewed as a big tax break, at the same time that he was preparing to ask for a general tax increase.

Last Tuesday morning, the rumor in Washington was that the President might sacrifice the tax credit to save his other tax proposal. Then word came that he would let the bill become law without a signature. At noon, word leaked from the White House that he would sign the bill, and at the same time call for a general tax increase. As it happened, the President signed and issued no statement.

**WHAT NOW?**—All of this did not happen easily or automatically. Observers in Washington agree that a great combined effort of the railroads and their suppliers played an important role in reversing last fall's ill-advised action.

We all owe a resounding vote of thanks to those who worked so long and so hard, but necessarily quietly and behind the scenes, to bring this about—especially the AAR, the RPI and the American Railway Car Institute. And the best thank-you notes will be those signed orders.

charge pits can take 150-200 tons an hour, and this will make possible snappy turnaround times.

Generally, though, IR is having a thin time in competition with increasingly intensive highway traffic. And the government's tariff policy doesn't help the situation at all.

Zwick told me: "At the beginning of 1966, we were eventually allowed to raise our traffic by 25% on freight—a long overdue adjustment. But for export traffic we were only allowed to raise our charges by 5%, so we are giving an indirect subsidy to the export trade."

It seems unlikely that the government will allow another increase for some time, particularly with a general election timed for early 1968. So the deficit seems likely to grow.

Like most railroad managers, Zwick wants to see his system running on sound commercial lines. But he's hampered at every turn by social responsibilities imposed by the politicians.

"One of our big problems is the amount of money we have to pay out in social benefits," he told me. "For instance we have to pay an amount corresponding to 25% of all salaries into a pension fund. Once upon a time someone picked this figure out of a hat and it's remained at that level ever since.

"Clearly it's ridiculous, and we're now having an actuarial study made to see what pensions really cost. At the moment this fund is costing us more than 20% of our annual income."

The number of passengers entitled to reduced fares creates further problems. IR is permitted to run only one class of passenger service. So what happens, ask IR officers, if air-conditioned cars are put in service at some expense, and full-rate passengers find themselves crowded out of them by low-rate passengers?

Claiming reduced fares are students (25% of the normal rate), teachers, soldiers, nurses, journalists and a fairly wide range of other professions. And for every one that travels, IR loses money.

During peak holiday periods, says Zwick, more than 50% of all passengers have privilege tickets, crowding out full-fare passengers who then often wave goodbye to the railroad for good.

Passengers carried last year totalled 4,600,000, a fall of 200,000 from the previous year, continuing the trend of several recent years.

The feeling is that IR officers might welcome a further tapering off of unprofitable traffic like this (even full fares are ridiculously low) while fighting as hard as possible for the revenue-earning mineral traffic. ■

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# PEOPLE IN THE NEWS

**AKRON, CANTON & YOUNGSTOWN.**—**Hugh J. Donohue** appointed regional manager-sales at Pittsburgh to succeed **E. C. Helland,** who retired May 31 after a railroad career of 48 years.

**BESSEMER & LAKE ERIE.**—**Edward R. Coates** appointed coal sales representative.

**CANADIAN NATIONAL.**—**R. F. Ruggiero** appointed mechanical assistant-car, Montreal, with specific responsibilities for open top car loading and specialized equipment. Mr. Ruggiero succeeds **H. G. Neale,** recently appointed assistant mechanical officer-car (freight), system, Montreal (RA, May 29, p. 74).

The following personnel changes have been announced for the Great Lakes Region: **C. S. Dunn,** assistant engineer structures, appointed bridges and structures engineer succeeding **G. H. Workman,** recently named assistant chief engineer—design and construction, system, Montreal (RA, May 29, p. 74); **W. G. Burdett,** freight sales analyst, Toronto area, appointed regional freight sales analyst to succeed **A. O. Oljemark,** promoted; **F. W. Mills,** investigator, appointed to the new position of freight claim representative to coordinate handling fruit and vegetable claims at various points; **D. G. Leggatt,** materials handling and loading representative, Toronto area, appointed sales development officer to succeed **G. F. Hennessy.** Mr. Hennessey, sales development officer, promoted to sales promotion officer succeeding **H. M. Browne.**

**E. G. Tufford,** Toronto area freight sales manager, London, appointed Toronto area freight sales manager at Toronto, succeeding **A. J. Wilson,** promoted.

**C. Renwicke,** project officer, Toronto, appointed terminal traffic manager, Toronto Express Terminal. Effective July 1, the terminal traffic manager, Toronto, will be responsible for over-all administration of the Terminal, reporting to the superintendent express freight. The title of project officer has been abolished.

**R. W. Kyle,** sales promotion officer, freight sales, Montreal, appointed assistant freight sales manager, Southwestern Toronto area, with headquarters at London.

**J. G. Lecours,** office assistant, industrial development, St. Lawrence region, appointed industrial development representative, Montreal area, succeeding **G. Gervais,** transferred.

**CANADIAN PACIFIC.**—**J. D. Flintoft** appointed manager planning, Prairie region, and **L. O. Smith** assistant manager planning, both with headquarters at Winnipeg, Man.

**W. L. Jewsbury** appointed regional supervisor, procedures, Prairie region, with headquarters at Winnipeg, succeeding **G. C. Harvey,** promoted.

**CHESAPEAKE & OHIO-BALTIMORE & OHIO.**—The following appointments in the Commercial Development Department have been announced: **John Tierney,** manager-special equipment; **Frank G. Schmaltz,** assistant manager-special equipment.

**CHICAGO & NORTH WESTERN.**—**D. L. Rosenbaum,** trainmaster, Twin Cities division, St. James, Minn., transferred to the Nebraska division, Sioux City, Iowa, to replace **S. F. Kujawa,** advanced to rules examiner, Chicago. **J. M. Hirschbein,** assistant trainmaster, M&StL division, Mason City, Iowa, succeeds Mr. Rosenbaum.

**DETROIT, TOLEDO & IRONTON-ANN ARBOR.**—**Harry E. Bennett** appointed manager, industrial engineering, with headquarters at Dearborn, Mich.

**DULUTH, MISSABE & IRON RANGE.**—**Vernon L. Ljungren** appointed director of engineering design with headquarters in the Wolvin Building, Duluth, Minn.

**ERIE LACKAWANNA.**—**C. H. Zimmerman,** assistant director of labor relations, appointed director of labor relations to succeed **T. J. Sanok,** who retired May 31 because of ill health. **J. R Freaney** named assistant director of labor relations.

**GREAT NORTHERN.**—Effective July 1, **B. G. Anderson,** assistant chief engineer, Lines East, advanced to assistant chief engineer, system, with headquarters remaining at St. Paul. **C. D. Archibald,** engineer maintenance of way, St. Paul, succeeds Mr. Anderson, and in turn is succeeded by **V. C. Hankins. C. F. Intlekofer,** district engineer, Seattle, named assistant chief engineer, Lines West, Seattle, to succeed **L. G. Reichert,** who retires June 30. Mr. Intlekofer's successor is **G. E. Scholze.**

**ILLINOIS CENTRAL.**—**Jack E. Andrews,** manager freight sales, named general manager coal sales.

J. R. Tomlinson
Reading

Franklin G. Fisher
Reading

**INTERSTATE COMMERCE COMMISSION.**—**Charles W. Haas,** associate regional director in Minneapolis, Minn., appointed regional manager in Chicago. The Chicago office supervises ICC field activities in Illinois, Indiana, Michigan, Minnesota, North Dakota, South Dakota and Wisconsin. Mr. Haas succeeds **N. Thomas Harris,** recently selected to serve as assistant director of the ICC's Bureau of Operations in Washington, D. C. (RA, May 29, p. 74).

**KENTUCKY & TENNESSEE.**—**L. C. Bruce** elected chairman of the board; **E. R Tindle,** president and general manager; **F. C. Thomas,** vice president; R. E. Gable, secretary and treasurer.

**MISSOURI PACIFIC-TEXAS & PACIFIC.**—**H. J. Ducote,** general agent, Atlanta, and **R. J. Haley,** general agent, Louisville, transferred to St. Louis and Cleveland, respectively. **G. W. Givens,** traffic representative, Pittsburgh, becomes general agent, Louisville.

**READING.**—**J. Richard Tomlinson** appointed assistant vice president—finance, and **Franklin G. Fisher** named assistant vice president—operations, Philadelphia. Mr. Tomlinson formerly was director of passenger services and will continue to coordinate functions of that department with public agencies which provide support for the region's commuter lines. Mr. Fisher formerly was general manager—operations, a position which has been discontinued.

**C. C. Funk, Jr.,** general manager, TOFC Service, resigned to take an active part in operating Funk's Hauling Service, formerly operated by his late father. **J. I. Smith, Jr.,** general manager sales, Central Region, Chicago, succeeds Mr. Funk at Philadelphia.

*(Continued on page 58)*

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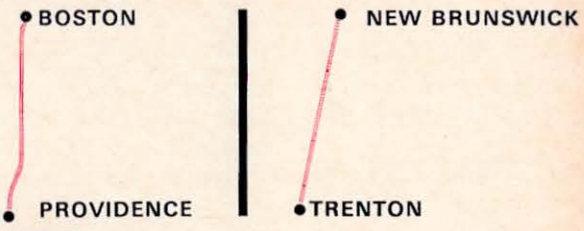


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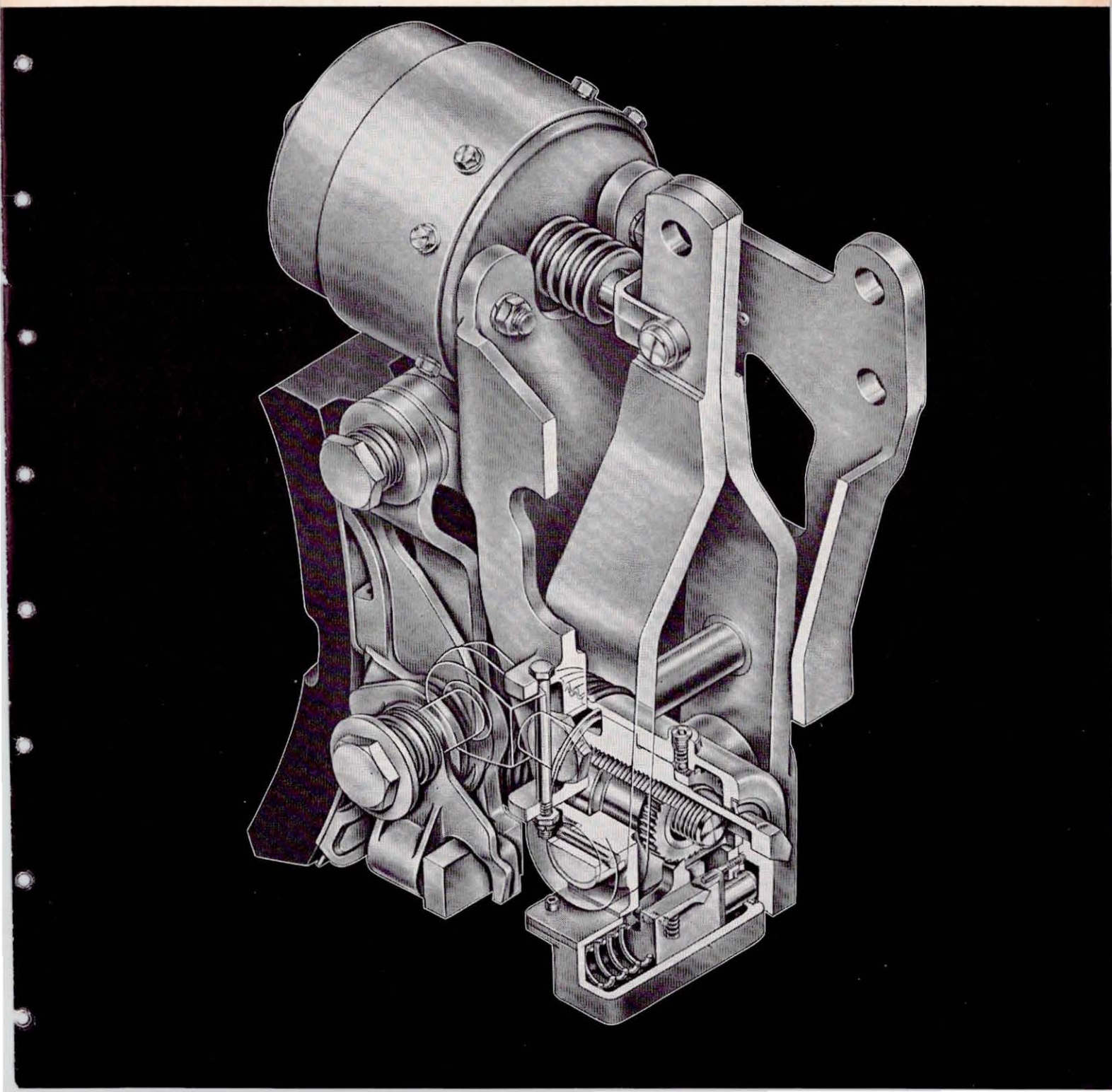

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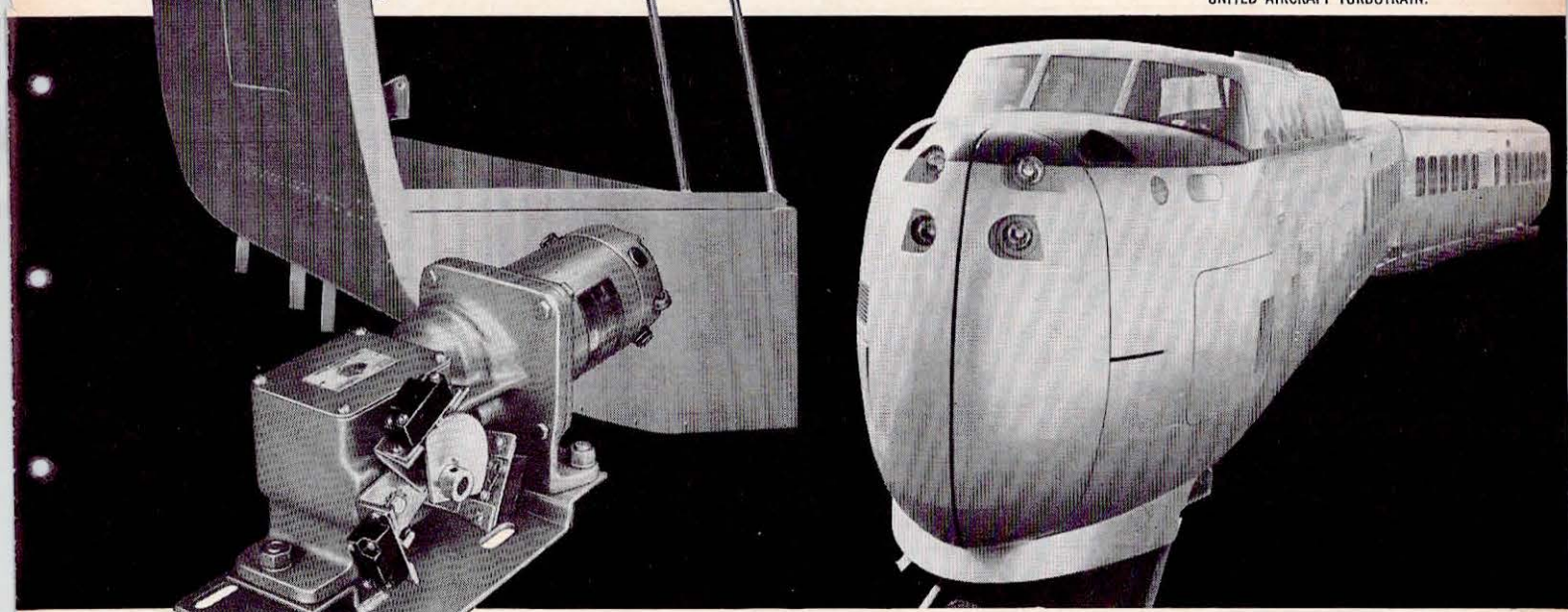

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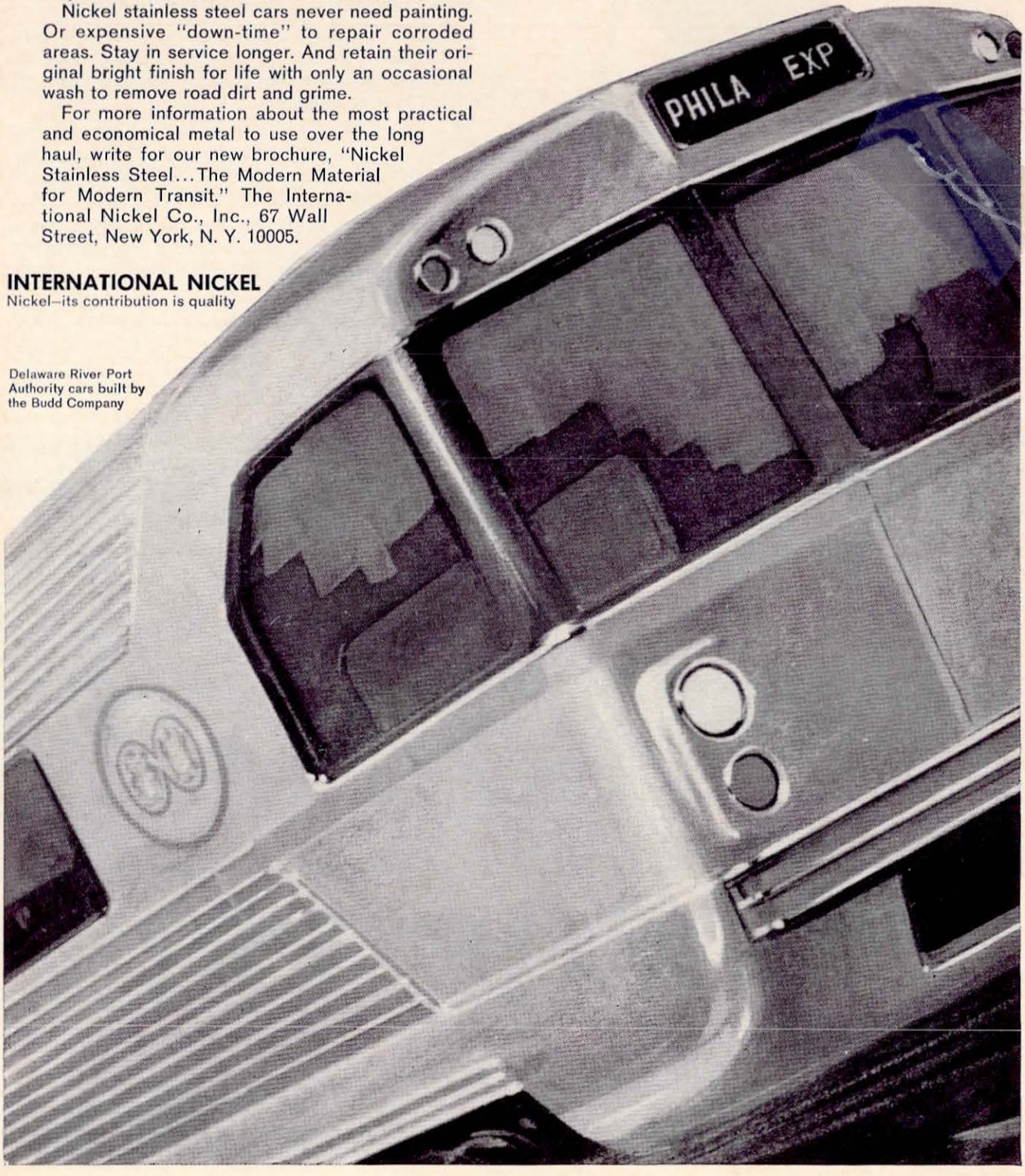


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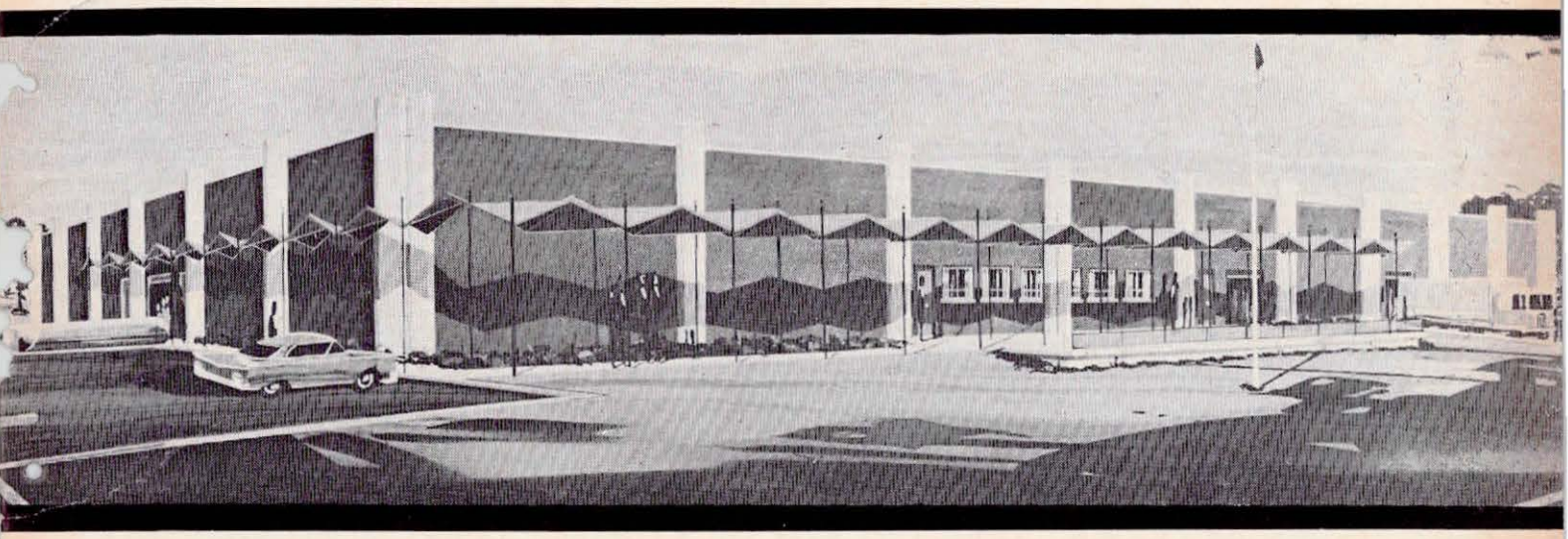

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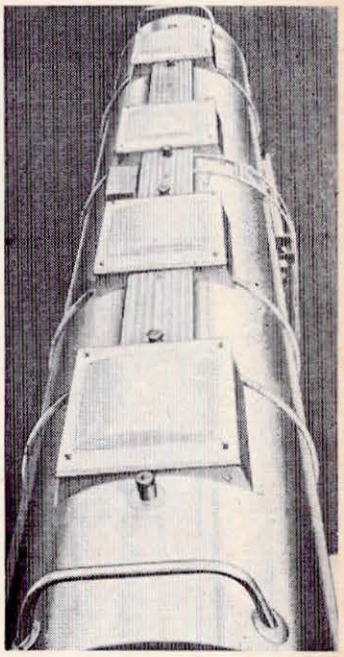

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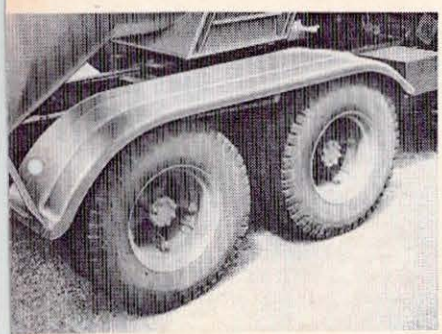

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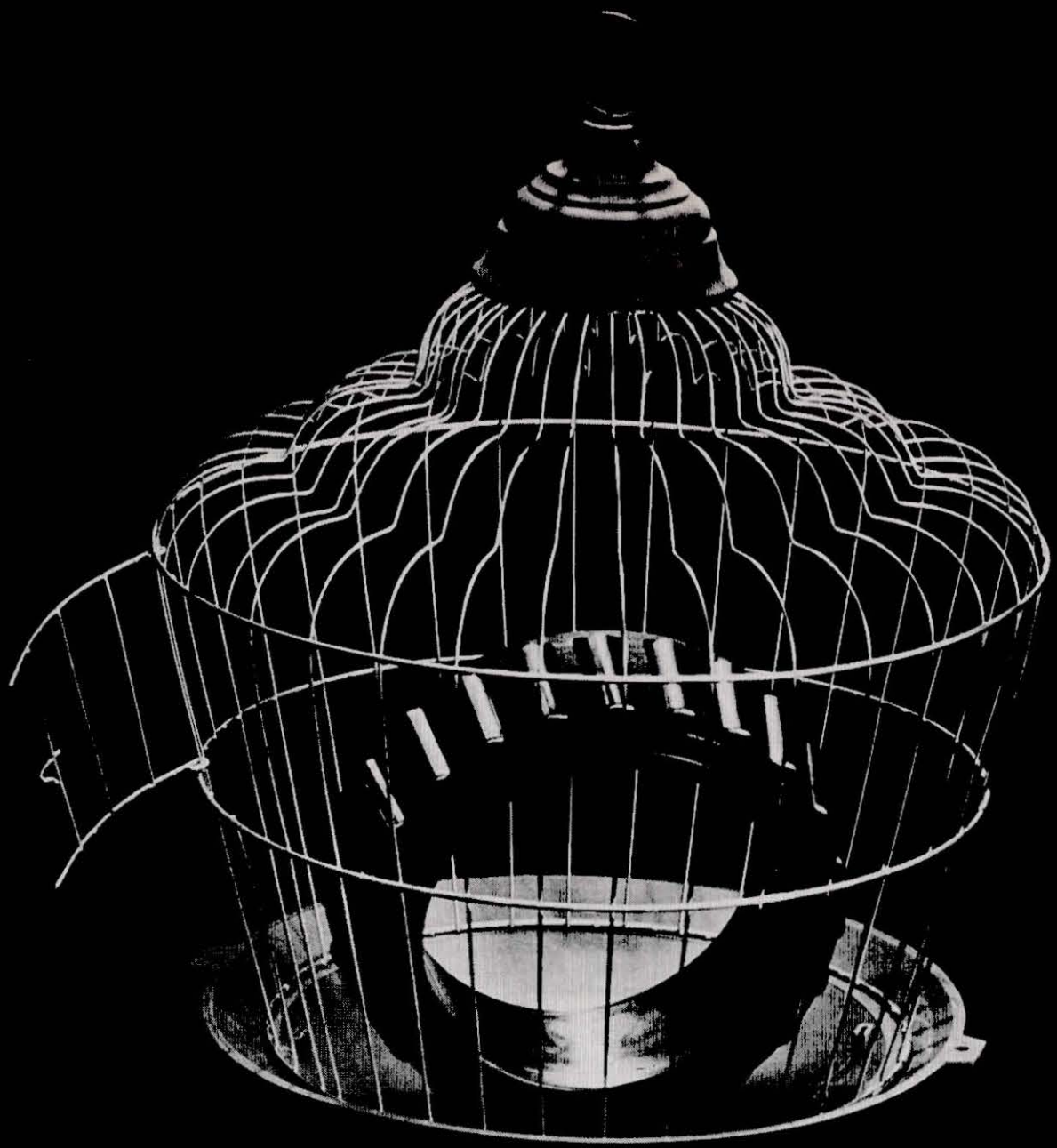

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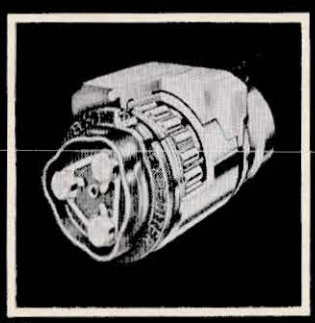

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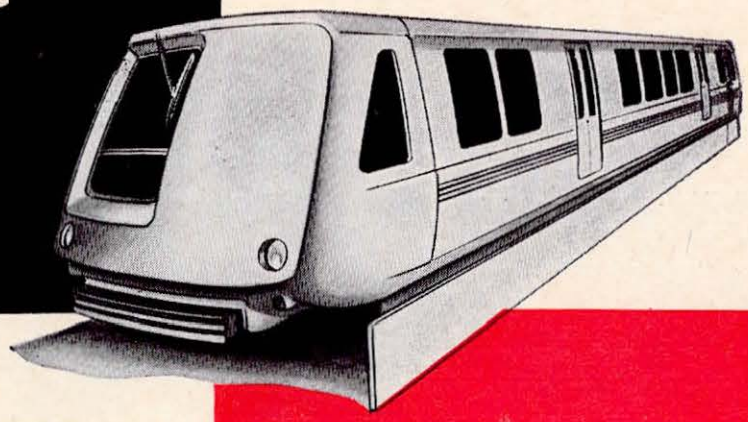
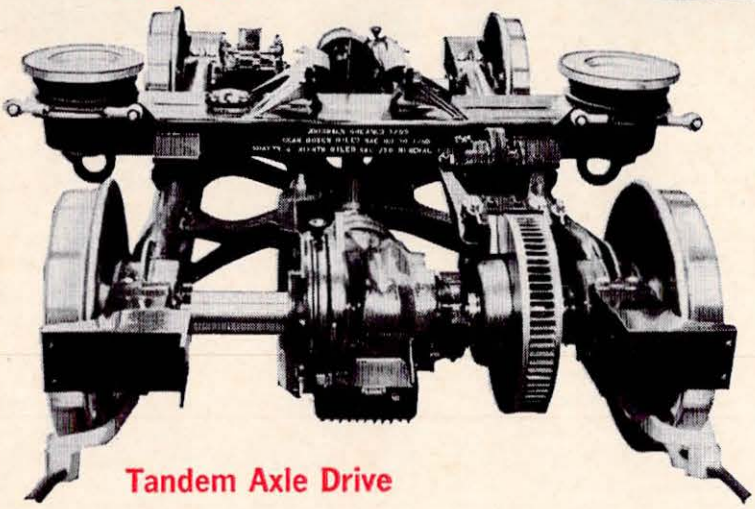


### DRIVES



Tandem Axle Drive

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- Used on BARTD test vehicle "A".
- Used on rail gas turbine train built by Budd Co., and being tested by MCTA on the Long Island R.R.

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Right angle and parallel single and double reduction traction drives for transit, main line rail cars and locomotives.

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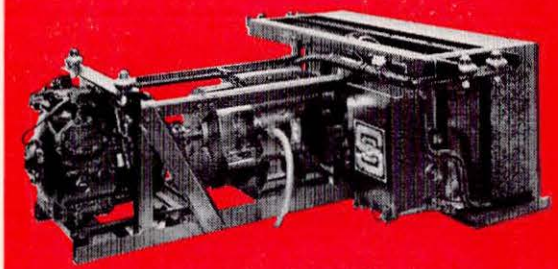

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# NEW PRODUCTS REPORT

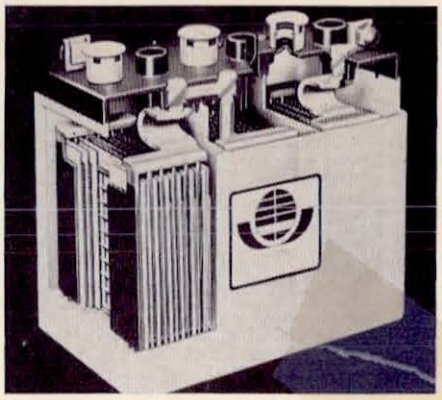
## Narrow-band Data Sets (RA-1)

Data sets that transmit 4800 bps digital data over telephone lines use a relatively narrow bandwidth and avoid the portion of the line that exhibits severe distortion. Demonstrations of Modem 4400/48, transmitting over a 3,000 mile telephone line indicate that error rates may be maintained at better than one in 1 million bits while eliminating monthly line conditioning charges and the constant monitoring previously associated with 4800 bps transmission. *Milgo Electronic Corp.*

## FM Two-Way Radio (RA-2)

A small, powerful hand-held two-way FM radio transmitter-receiver using the 148-174 MHz band is solid state, weighs 18 oz and measures 7 x ⅞ x 2⅜ inches. Despite its size, it has a full watt of RF output. Transmitter audio compression automatically controls microphone level.

Either one-frequency or two-frequency versions may be obtained with tone-squelch transmit or selective calling individuals or groups. *General Electric Communications.*

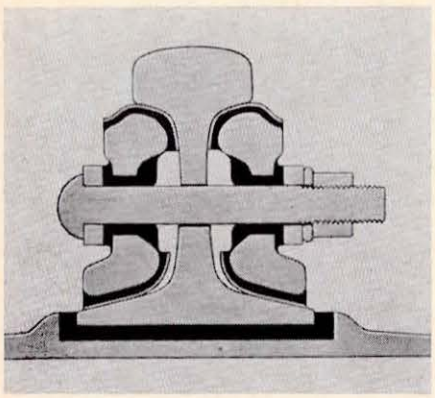


## Communications Battery (RA-3)

A new 6-volt, 100 a h battery is designed to eliminate major in-service problems created by top corrosion, leaking seals, and unexpected structural and mechanical failure.

"Flex straps" absorb internal plate growth eliminating element and container distortion, the major cause of premature failure.

The injection-molded cover and container are thermally welded together to form a one-piece unit preventing leakage. *Globe Union Inc.*



## Improved Rail Joint (RA-4)

Vulca Bond insulated rail joint has been redesigned with two specific improvements. The metal clads which cap the elastomer at the top of the rail joint no longer protrude beyond the overhang of the rail.

Secondly, the clads are now perforated so that, during the molding process, the Buna-N elastomer, used for the insulating elements of the joint, flows into the holes to form a strong mechanical bond. *Johnson Rubber Co.*

## Oil Extender (RA-5)

Mobilsol 66, an aromatic non-reactive oil extender, is said to be compatible with epoxy resins in unfilled compounds up to 40-50 phr and to cut the cost of epoxy paints 50 cents per gallon. The extended compounds produce hard, dry, tack-free films that show good adhesion to metals and other materials. The extender is recommended for use in the maintenance of railroad equipment and right-of-way facilities. *Mobil Oil Corporation.*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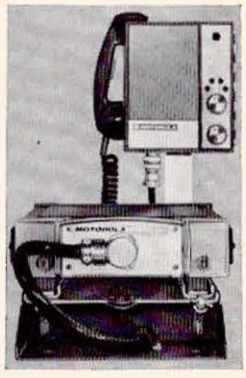

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*(Continued from page 48)*

**SOUTHERN.—Howard W. Rhymer,** general yardmaster, Jackson, Fla., appointed superintendent terminals, Andover, Va.

**SOUTHERN PACIFIC.—J. C. Presswood,** assistant to general freight and passenger agent, Houston, named district freight and passenger agent, Dallas. **B. C. Symmank** replaces Mr. Presswood.

**William M. Jones,** assistant superintendent, Los Angeles Division, appointed superintendent, Western Division, Oakland, Calif., succeeding **Robert L. King** (RA, June 5, p. 31).

**TORONTO, HAMILTON & BUFFALO.—Stewart A. Davis** appointed purchasing agent to succeed **William J. Nicholl,** who retired May 31.

**WESTERN MARYLAND.—Neil Z. Meredith** appointed superintendent transportation, Hagerstown, Md., to succeed **Earl C. Leather,** effective July 1. Mr. Leather will retire June 30 after more than 49 years of service with the company.

**C. R. Madden,** manager machine accounting, Hagerstown, retired June 1 after nearly 44 years of service with the WM. **H. A. Baker** promoted to manager, data processing, Hagerstown.

## TRANSIT

**Rusell L. Bowersox,** director of advertising, transportation equipment projects and marketing operation of **General Electric's** Transportation Systems Division, has been promoted to the newly created position of manager, market development and communications of the same division. Mr. Bowersox will continue as editor of the GE magazine, Going Places.

R. L. Bowersox
GE

C. R. Englund, Jr.
Barrington

**Carl R. Englund, Jr.,** formerly project director, **Southeastern Pennsylvania Transportation Authority,** appointed vice president—operations, **Barrington and Co.,** a New York management consulting firm. Mr. Englund will be particularly concerned with transit and transportation.

**Earl W. Nelson** has been appointed chief engineer for rapid transit, **Metropolitan Atlanta Rapid Transit Authority.** Mr. Nelson was formerly a deputy director, Ohio State Department of Highways. In his new position, Mr. Nelson will report directly to **Henry L. Stuart,** general manager of MARTA.

**D. H. James** has been appointed director of transit operations, **Alan M. Voorhees & Associates, Inc.,** McLean, Va. The firm is currently engaged in transit planning activities for the District of Columbia, Honolulu, Memphis, Minneapolis and Boston, as well as Caracas, Venezuela; and Calgary, Alta., Canada. Mr. James was formerly associated with the engineering firm of Parsons, Brinckerhoff, Quade & Douglas of New York.

**Harold A. Foster** and **Werner A. Tikkanen** have been named associates of **Parsons, Brinckerhoff, Quade & Douglas.** Mr. Foster heads the Boston office and is engaged as project manager in charge of preparation of plans for the South Cove rapid transit project and a preliminary design report and final plans for the six-mile extension of the South Shore rapid transit line, both undertaken by the firm for the Massachusetts Bay Transportation Authority. Mr. Tikkanen, also of the Boston office, is project engineer in charge of location studies and the basic design report concerning a new state highway, the Shawmut Trail, for the Dept. of Public Works, Commonwealth of Massachusetts.

**Norman W. Seip** has been elected chairman, Advisory Council, **Institute for Rapid Transit,** Chicago. Mr. Seip is manager of transportation equipment, projects and marketing operation, **General Electric Co. George L. DeMent,** chairman, **Chicago Transit Board,** has been re-elected president of IRT.

**John R. Kennedy** has been appointed general counsel, **National Capital Transportation Agency,** Washington, D.C. Mr. Kennedy joined the NCTA in March 1966 as assistant general counsel. He has been acting general counsel since the resignation of **Owen J. Malone** in April.

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# TurboTrain's design features

*(Continued from page 28)*

curves considerably higher than those possible with standard trains.

● **New features.** Many features of the trains required new design efforts by suppliers, in some cases bringing to railroading technology from other fields. The large clam-shell-shaped nose doors, formed of fiberglass-reinforced plastic, are opened to permit train-to-train passage when TurboTrains are operating in tandem. The synchronized opening of the door halves is accomplished with a pair of electrically driven actuators designed for the application by Lundy Electronics & Systems.

Another actuator based on the Vapor Dor-Trol system is used for opening and closing the aircraft-style plug doors and the steps on the sides of the cars. Vapor engineers found that, with modification, conventional Dor-Trol units built for transit cars could be utilized. Their action involves moving the door inward several inches before traversing it longitudinally into a door pocket in the car structure. Steps are arranged for either track-level platforms or those corresponding to floor height of standard cars.

● **Truck actuators.** Ball-bearing screw actuators similar to those used in automotive steering systems serve to guide the single- and dual-axle trucks of the TurboTrain by keeping wheels constantly tangent to the rails, reducing flange wear and eliminating uncomfortable truck action.

Beaver actuators used on the power dome cars have 2½-inch-diameter screws to handle normal loads of 8,000 pounds and peaks of 45,000 pounds. The Saginaw actuators for the single-axle trucks handle 3,000-pound normal loads and 9,000-pound peaks.

As part of the over-all truck design, precision wheel-and-axle sets were produced for the trains. The sets made by Standard Steel, for instance, were checked ultrasonically and by magnetic particle test prior to machining to a 125-microinch finish and subsequent shot peening to eliminate any stress concentrations.

● **Aluminum construction.** The aluminum carbodies are assembled from sheet and plate ranging from ⅛ to 1 inch in thickness and from many extrusions. Alcoa supplied all this material for the D.O.T. trains and roof sheets for the CN trains where width was beyond Canadian domestic production capacity. Alcan supplied the remainder of the material for CN trains. ■


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32 vdc/1800 watts

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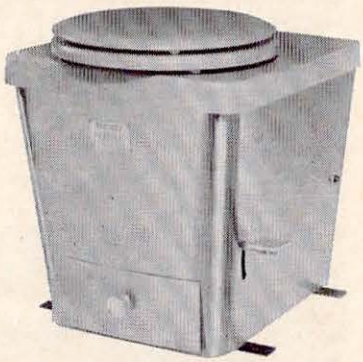
New federal and state laws look seriously upon all water-flush or direct dumping methods aboard rail transport. Only Research Products incinerating toilet systems have **no** raw human waste effluents detrimental to surface and stream, and no atmospheric effluents which pollute the air.

Purchase of INCINOLET model DLNL for locomotive, and Research Products' new linerless INCINOLET CB-L for caboose — each designed specifically for the railroads — — ensure equipment planning geared to long-range need and requirements new to the railroad industry.



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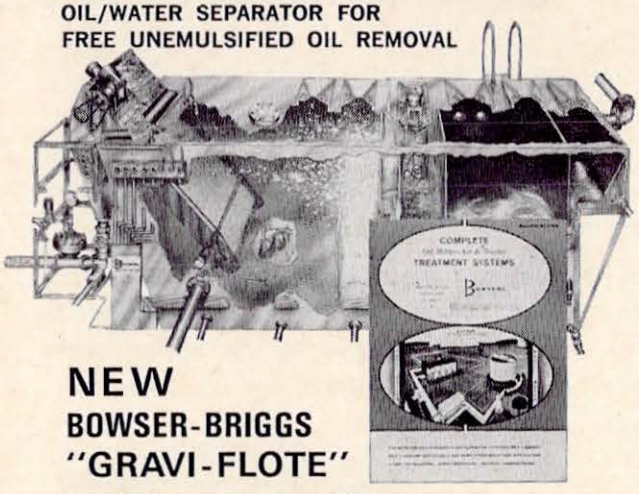

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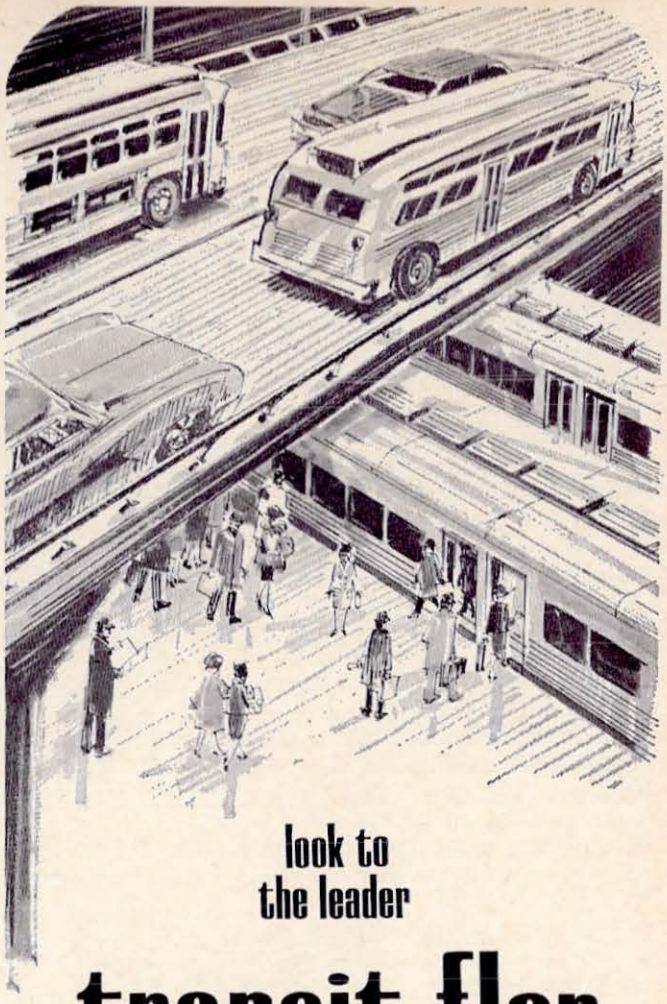

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# MARKET OUTLOOK

## Carloadings

Loadings of revenue freight in the week ended June 10 totaled 577,225 cars, the Association of American Railroads announced on June 15. This was an increase of 68,389 cars, or 13.4%, compared with the previous week; a decrease of 43,930 cars, or 7.1%, compared with the corresponding week last year; and a decrease of 27,118 cars, or 4.5%, compared with the equivalent 1965 week. Ton-miles generated by carloadings in the week ended June 10 are estimated at 14.8 billion, a decrease of 4.8% below the corresponding week of 1966, and 4.2% above the 1965 week.

REVENUE FREIGHT CARLOADINGS

For the week ended Saturday, June 10

| District | 1967 | 1966 | 1965 |
|---|---|---|---|
| Eastern, including Allegheny and Pocahontas | 231,069 | 249,266 | 246,076 |
| Southern | 115,982 | 113,312 | 110,861 |
| Total Eastern and Southern Districts | 347,051 | 362,578 | 356,937 |
| Northwestern | 80,421 | 95,256 | 90,229 |
| Central Western | 110,272 | 121,696 | 116,034 |
| Southwestern | 39,481 | 41,625 | 41,143 |
| Total Western Districts | 230,174 | 258,577 | 247,406 |
| Total All Roads | 577,225 | 621,155 | 604,343 |
| Commodities: | | | |
| Grain and Grain products | 45,268 | 57,760 | 54,215 |
| Livestock | 1,052 | 1,390 | 1,284 |
| Coal | 118,690 | 121,220 | 116,414 |
| Coke | 7,271 | 8,678 | 8,521 |
| Forest Products | 41,363 | 40,346 | 37,031 |
| Ore | 55,094 | 62,397 | 57,053 |
| Merchandise l.c.l. | 5,062 | 6,281 | 9,171 |
| Miscellaneous | 303,425 | 323,083 | 320,654 |
| June 10 | 577,225 | 621,155 | 604,343 |
| June 3 | 508,836 | 547,685 | 530,484 |
| May 27 | 573,652 | 611,744 | 600,776 |
| May 20 | 571,344 | 609,325 | 598,678 |
| May 13 | 575,596 | 611,161 | 593,858 |
| Cumulative total, 23 weeks | 12,352,572 | 12,822,167 | 12,650,277 |
| Estimated revenue ton-miles (billions) 23 weeks | 320.0 | 323.3 | 298.8 |

**PIGGYBACK CARLOADINGS.**—U. S. piggyback loadings for the week ended June 3 totaled 20,587 cars, carrying 33,498 trailers, compared with 19,172 cars, carrying 32,032 trailers, in the corresponding 1966 week. Loadings for 1967 up to June 3 totaled 492,090 cars, carrying 809,329 trailers, compared with 469,372 cars, carrying 775,835 trailers, in the corresponding period of 1966.

**IN CANADA**—Canadian loadings were not available as this issue went to press.

## ROLLING STOCK

► *Atlantic Coast Line.*—Ordered 1,600 box cars as part of a $25 million equipment program announced last week. All are scheduled for fourth-quarter delivery.

► *Atlantic Coast Line.*—Ordered 16 high-horsepower diesel-electric locomotives from General Electric for December delivery.

► *Frisco.*—Will place orders for 12 locomotives and 732 freight cars, at a total estimated cost of almost $16 million. Locomotives will be high-horsepower road freight units.

► *Great Northern.*—In an expansion of its 1967 capital spending program, GN is ordering 10 1,500-hp diesel-electric switching units from EMD. In addition, executive committee approval was to be sought June 16 for purchase of 300 100-ton covered hoppers from Pullman-Standard.

► *Missouri Pacific.*—Capital-spending program for 1967 will be increased by more than $18 million, with new orders for 1,030 freight cars. The addition will bring MP's total '67 equipment program to more than $48 million, for 2,268 freight cars, 20 locomotives and the rebuilding of 1,800 freight cars.

► *New York Central.*—Will purchase 65 3,000 hp diesel electric locomotives from EMD and General Electric at a total cost estimated at $14.5 million.

► *New York Central.*—Ordered 250 52½-ft, high-side gondola cars from its Despatch Shops at a cost of $3.5 million.

► *Norfolk & Western.*—Announced the placing of orders for 1,769 new freight cars. Pullman-Standard will supply 1,000 70-ton box cars equipped with damage-reducing devices; General American will build 58 3,180-cu-ft-capacity, 100-ton Airslide covered hopper cars; and Thrall Car will supply eight 86-ft, 100-ton, hi-cube cars and three 200-ton depressed center flats. N&W's own shops are supplying 650 50-ton boxes and 50 70-ton bulkhead flats.

► *Norfolk & Western.*—Ordered 50 3,000-hp diesel-electric locomotives. EMD will supply 30 GP-40's and General Electric will supply 20 U-30B's.

► *Soo Line.*—Directors authorized 1968 equipment program covering acquisition of 10 new locomotives, 450 freight cars and 11 units of company-service equipment at a total cost of $10,050,000.

► *Union Pacific.*—Ordered 1,995 new freight-train cars at a total cost of $31.5 million.

## PIGGYBACK

► *Canadian National.*—Purchased 50 new refrigerated piggyback trailers designed to improve temperature control and reduce dehydration of perishable goods. Designed to CN specifications, 40 of the new trailers will be built by Fruehauf Trailers of Canada, Ltd., the remaining 10 will be supplied by Canadian Trailmobile, Ltd.

► *Pennsylvania.*—Purchased 100 Flexi-Van containers from Strick for use in mail service. PRR has acquired 50 special flat cars for this service from the New York Central.

# YOU OUGHT TO KNOW

**Loomis cited by Army:** One of the U.S. Army's highest awards to a private citizen has been presented to former AAR President Daniel P. Loomis. As head of the AAR from August 1957 to May 1967 Loomis was cited for being instrumental "in developing procedures for assuring effective and timely rail service to meet military requirements in peacetime and during emergencies." Loomis was presented the Outstanding Civilian Service Medal at ceremonies in the office of Maj. Gen. John J. Lane, Commander of the Military Traffic Management and Terminal Service.

**Moving apartments by rail:** The Pennsylvania has helped ship 24 two-story apartment buildings to Belgium for families of NATO's new military headquarters. The structures, broken down into 192 pre-engineered apartment units, were packed in 40-foot metal containers. They were shipped from the U.S. Steel Homes Division at New Albany, Ind., to New York for overseas delivery by Belgian Lines. The first of the apartments will be ready for occupancy by August.

**A rush for jobs at D.O.T.:** The newly-formed Department of Transportation has been swamped with job applicants—nearly 10,000 so far. The number of job seekers outnumbers the amount of positions available. However, D.O.T. says it is still in the market for people with highly specialized transportation, economics and human engineering backgrounds.

**Export awards presented:** The Central of Georgia and Nordberg Manufacturing Company have received Presidential "E" awards for excellence in exporting. The railroad won its award for encouraging and aiding export expansion from the Southeastern U.S., and especially for its efforts in promoting the port of Savannah. Nordberg, a manufacturer of railway track maintenance rigs, diesel engines and other heavy equipment, won an award for aggressively promoting an export expansion program.

**Summer passenger fares on PRR:** Low, one-day, round-trip fares between Philadelphia and Wilmington to New York on the Pennsylvania have been extended to include children under 16. PRR is offering the new children's rate in conjunction with its regular Ladies Day fares. Last year, PRR sold 72,500 Ladies Day tickets.

**GATX gets new president:** J. R. Scanlin has been elected president of General American Transportation Corp. to succeed S. D. Moseley. T. M. Thompson, GATX chairman, said Moseley had resigned for personal reasons. Scanlin, who has been with the company for the past 36 years, had been group vice president of GATX and head of its Tank Car Division.

**New home for the AAR:** Construction of a new American Railroads Building at 20th and L Streets, is scheduled to get under way in Washington July 1. The Association of American Railroads will occupy half of the eight-story, 93,000-square-foot structure. It will have three levels of underground parking.

**New chlorine car:** ACF has designed an 85-ton tank car for carrying 170,000 pounds or 16,500 gallons of liquid chlorine. The car has a stub-sill underframe, is 45 feet long and 15 feet high. Four inches of foam insulate the tank.

**Concrete ties promoted:** "Concrete Crossties Come of Age on American Railroads" is the title of a new 16 mm., sound-color motion picture now being distributed by the Portland Cement Association. It emphasizes, says PCA, that "concrete crossties are now entering the regular operational stages for construction and maintenance purposes on many American railroads."

**Truck tonnage:** Intercity truck tonnage in the holiday week ended June 3 was 14.6% below that of the previous week and 7.1% below the volume in the corresponding week of 1966, according to American Trucking Associations.

## Current statistics

| | |
|---|---|
| **Net Income** | |
| 3 mos., 1967 | $120,000,000 |
| 3 mos., 1966 | 172,000,000 |
| **Carloadings, revenue freight** | |
| 23 wks., 1967 | 12,352,572 |
| 23 wks., 1966 | 12,822,167 |
| **Freight cars on order** | |
| May 1, 1967 | 34,960 |
| May 1, 1966 | 59,317 |
| **Freight cars delivered** | |
| 4 mos., 1967 | 32,785 |
| 4 mos., 1966 | 29,300 |
| **Serviceable cars** | |
| May 1, 1967 | 1,422,886 |
| May 1, 1966 | 1,410,539 |

# Transit tour: A "teach-in"

*(Continued from page 40)*

gineering; and J. George Thon, division manager, Bechtel Corp.

● **Hamburg vs. Berlin.** Turnpike Engineers' President Ross Ritter had already seen the Hamburg system, but was glad to see it again in the company of the group. So, understandably, was U.S. Steel marketing representative R. B. Cutshall. After Berlin officials extolled the virtues of their aluminum cars, Hamburg officials such as HHB President Max Mross and chief staff engineer Dr. Karl Lippacher told why they preferred stainless steel cars and are ordering more.

Hamburg is experimenting with two ATC systems, both of German make. Creation of a super-transport planning agency responsible for rapid transit, buses and commuter operations in the region was of great interest to policymakers Sickles. Gleason and Rhoads.

● **21st Century planning.** Pierre Weil, director general of the Paris RATP, impressed the American visitors with the fact that his administration took over a dilapidated physical plant and is pumping bigger and bigger sums into it every year. "We are planning now," he said, "not just for 1980, but for the year 2000."

Tour members donned slickers and boots for an inspection of a deep-level station on the coming high speed Regional Express, then rode the automatic rubber-tired train on Metro Line 11. ATC impressed the visitors, the rubber tires not so much. Interestingly enough, the high-speed line will revert to the steel-on-steel principle.

● **The Barcelona Congress.** Winding up the tour was a visit to the 37th Congress of the International Union of Public Transport (UITP) in Barcelona, where technical sessions alternated with inspections of the local Metro's car shops, training school and ATC, and receptions that drew 1,200 delegates from systems all over the world.

From there, some returned home, while others continued their inspection tour with visits to the London, Stockholm and Oslo systems.

Was it all worth while? Absolutely, said Charles Bowen, president of Rose City Transit and former president of the American Transit Assn.: "We came over here wanting to see a heck of a lot, and we wound up seeing even more than we bargained for. Everybody was wonderful to us, the whole experience was wonderful." ■


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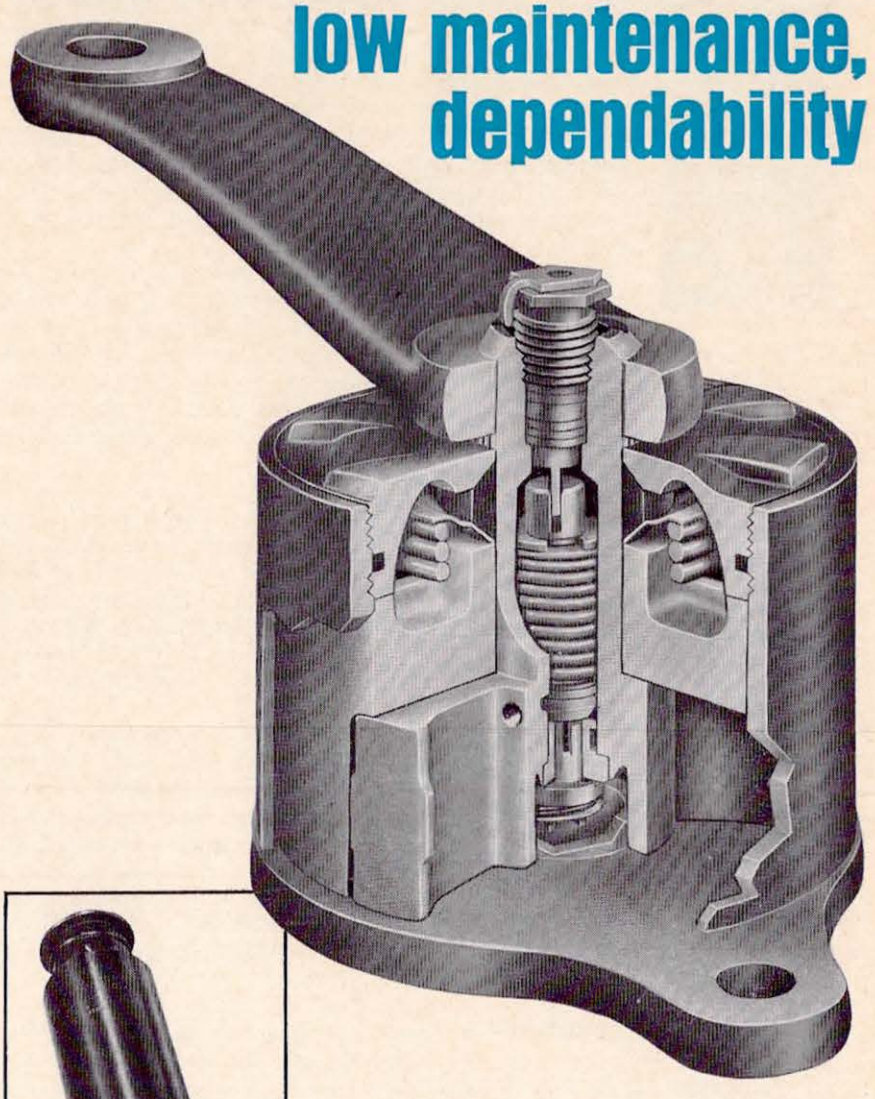

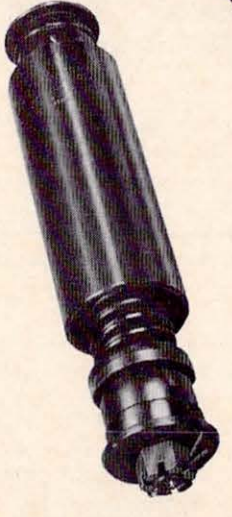

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## WATCHING **WASHINGTON** WITH WALTER TAFT

TAFT

**COMING HOME**—When the Senate confirms their appointments to the ICC, as expected, Dale W. Hardin and Grant E. Syphers will be returning to an agency which they served at earlier stages of their careers. The appointments were sent to the Senate by President Johnson on June 7 (RA, June 12, p. 7). Hardin was with the Commission from 1955 until 1963, as its legislative attorney and Congressional liaison officer. Syphers was a member of its staff from 1938 until 1947, serving in turn as attorney, special agent and district supervisor.

Hardin was special counsel for American Trucking Associations in Washington when his appointment came. He had previously been manager of the Transportation and Communications Department of the U.S. Chamber of Commerce and vice president of Overmeyer Company, a warehousing firm. In the 20 years since his Commission service, Syphers has been with the California Public Utilities Commission. He is now director of its Southern California Area in Los Angeles.

**NOT COMMISSION CAREERISTS**—Neither is a Commission careerist, however, in the sense that this term was applied to former commissioners who moved up from staff positions. These have included Patrick J. Farrell, who was the Commission's general counsel, and Frank McManamy, Charles D. Mahaffie, John L. Rogers and William J. Patterson, who were directors respectively, of the Commission's former bureaus of Locomotive Inspection, Finance, Motor Carriers, and Safety.

Things have sometimes gone the other way. Commissioners failing to get reappointed, or facing that prospect, have taken jobs on the staff. These have included Farrell, who returned to the legal staff, Hugh M. Tate, who also accepted a position there, and Ernest I. Lewis who became director of the former Bureau of Valuation. While the practice of taking care of former commissioners had not been followed for many years when the Lewis case came up in the early Thirties, it had a 1914 precedent. That was when one of Lewis' predecessors in the directorship of the Valuation Bureau, Charles A. Prouty, resigned from the Commission to accept that position.

**POLICING EXPERTISE**—Incidentally, Appointees Hardin and Syphers were formerly with the Federal Bureau of Investigation. So the Commission should have much expertise for its administration of penalty provisions in the Interstate Commerce Act and related statutes like the Elkins Act. Commissioner Paul J. Tierney, the Commission's present vice-chairman, also served with the FBI—for 14 years, from 1939 until 1953.

**LOSS FOR NORTHWEST**—When Syphers takes over as successor to Commissioner Abe McGregor Goff of Idaho, the Northwest will be without the representation on the Commission which it has had for 50 years, with only one year out. Clyde B. Aitchison of Oregon was a commissioner from 1917 until 1952 and there was also a commissioner from Washington, Johnston B. Campbell, from 1921 until 1929. The year after Aitchison retired was the interim year, but Owen Clarke of Washington was then appointed. When Clarke resigned to become vice president of the Chesapeake & Ohio, he was succeeded by Goff, who has served more than 9 years. His latest term expired at the end of last year, but he has remained with benefit of that provision of the Act which leaves a commissioner on the job until his successor qualifies.

Hardin will succeed Charles A. Webb. Both are Virginians. This membership has been vacant since April 1 when Webb left to become president of the National Association of Motor Bus Owners. Both Hardin and Syphers are Republicans, as are Webb and Goff. The Commission already has all the Democrats allowed by the Act which says no more than a majority of the 11 members shall be affiliated with the same political party.


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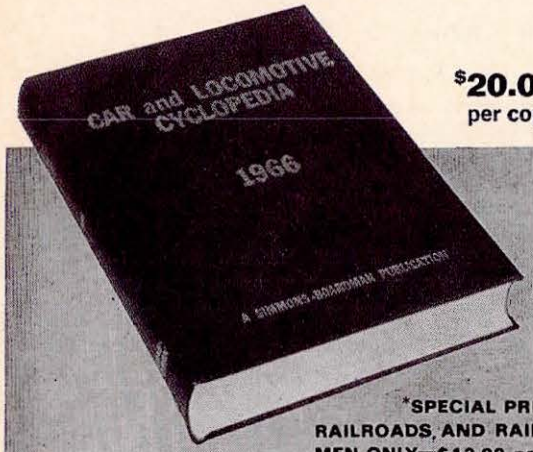


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VIEWPOINT

# What—another Train X?

Is the railroad passenger business really worth bothering about? We think it is, for a number of reasons—one of which is that passenger-train service is still bringing in close to $1 billion a year. Only 80 of our biggest industries did a gross business of $1 billion last year.

On the other hand, an income of $1 billion isn't very attractive if the corresponding outgo is $1 billion *plus* $420 million. That was the dismal picture that confronted railroads last year.

Can this deficit be shaved away? Is there a truly economic market for the passenger train?

Recently the search for an answer has been intensified. One solution, many believe, may be a brand new generation of passenger trains. And one approach down this avenue has been the development of the TurboTrain.

## The dissenters

The front cover of this week's issue of Railway Age, featuring the TurboTrain, may well prove to be among the most controversial in this magazine's 111 years of publication.

There are those, within our industry, who feel that the passenger train is dead, and that any further dressing up of the corpse will only add to the cost of the funeral.

Others are convinced that there's a future for mass transportation on (or at least very near) the surface, but they doubt that the steel wheel on the steel rail is any longer equal to the task. They talk of air-cushion vehicles, pneumatic tubes and other Flash Gordon concepts.

Still others want no change at all. Yesterday's trains are good enough for them, and they will fight to their last breath to keep them today and forever.

A more sophisticated group, while favoring experimentation, nonetheless has reservations about this particular train. Does it really differ from the Train X's that flopped so dismally a decade ago. when the "lightweight derby" fizzled out far ahead of the finish line? Isn't this the most expensive train ever built? Did it really have to be engineered to such exacting aircraft standards?

There is at least a modicum of good sense in all of these arguments.

Some passenger trains are certainly dead, and we enthusiastically support those railroads who want to do away with obsolete services that can no longer pay their way. (People who insist that they are "entitled" to a choice of transportation modes don't talk like the free enterprisers that they pretend to be: They're entitled to whatever they can afford to pay for, or persuade their local, state or federal tax authorities to pay for.)

Nor are we prepared to make fun of the Flash Gordon fans. The French railways will soon build a 20-mile test track for further trials of Jean Bertin's Aerotrain, which floats on a thin cushion of air. Japanese railway engineers suggest that within about 30 years, the air-cushion train will supersede even the New Tokaido Line.

Continuing to straddle fences in the order that we constructed them, we further suggest that some of yesterday's trains have many more years of profitable operation in those long-haul services that can still meet the cash-register test. And we concede that recent history gives some support to those who view the TurboTrain with skepticism.

If all of this is inconclusive and confusing, then so is the situation that confronts us. The answer to today's problems of mass surface transportation simply hasn't been found yet. Our own guess is that when it *is* found, it is going to involve a little bit of yesterday, some of today, and a lot of tomorrow.

## Give it a chance

We therefore applaud the enterprise of the United Aircraft Company in engineering this new train concept—and the daring of the U.S. Department of Commerce and the Canadian National Railways, respectively, for making production models possible.

The TurboTrain will soon be in operation in this country and, a little later, in Canada. Ride it.

Then make up your mind.

There were doubtless those, before the first primitive brake was invented, who doubted that the wheel itself would ever be more than a caveboy's toy.

More recently, there have been those who were amused at the idea that the flying machine would ever be a serious competitor of railroads for passenger traffic. Railway Age was among the scoffers.

This time, we're going to wait and see.

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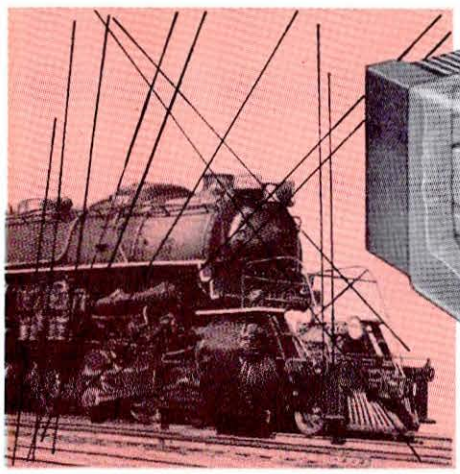

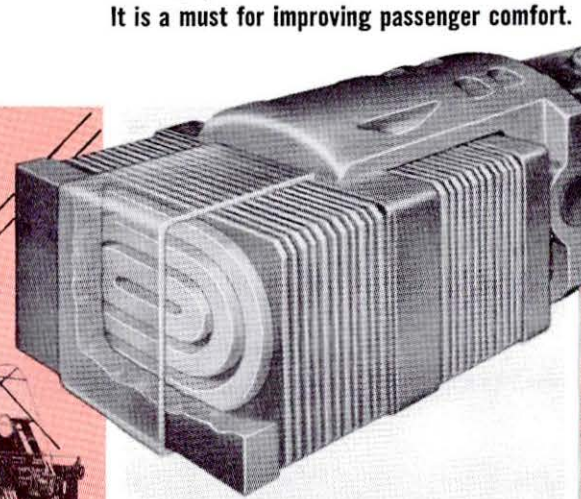

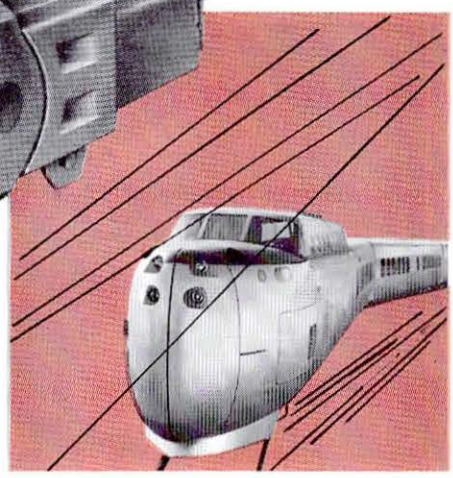

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